"A study to assess the effectiveness of demonstration on the knowledge and skill regarding surgical safety among operating room nurses working at AIIMS, Bhopal."

Dissertation

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In partial fulfilment of the requirement for the degree of

M.Sc. in Medical Surgical Nursing

(Critical Care Nursing)

By

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July 2024

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, BHOPAL

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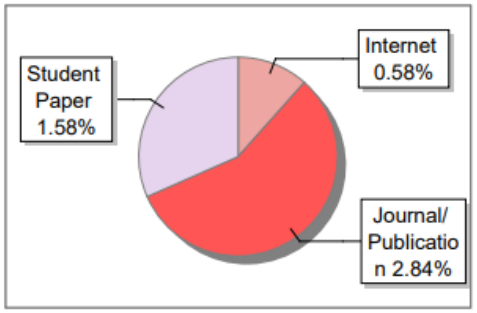

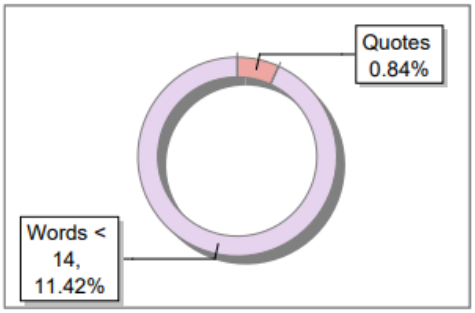

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Letter of Permission

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AIIMS, Bhopal Institutional Human Ethics Committee- Student Research (IHEC-SR) in its 7th meeting held on 22nd February 2023 discussed your proposal titled **"Effectiveness of demonstration on the knowledge and skill regarding surgical safety among operating room nurses working at AIIMS, Bhopal"** and evaluated it for suitability for your dissertation as required for fulfilment of MSc (Nursing).

Following members attended the meeting:

1. Prof. D. K. Pal, Former HoD Community Medicine, GMC, Bhopal.....Chairperson
2. Prof. Rajnish Joshi, Professor of General Medicine, AIIMS, Bhopal.....Member
3. Prof. Amit Agrawal, Professor of Neurosurgery, AIIMS, Bhopal.....Member
4. Dr. Sunita Athawale, Professor of Anatomy, AIIMS, Bhopal.....Member
5. Dr. Girish Bhatt, Addl. Professor of Paediatrics, AIIMS, Bhopal.....Member
6. Dr. Ujjawal Khurana, Assoc. Professor of Pathology, AIIMS, Bhopal.....Member
7. Dr. Ankur Joshi, Assoc. Professor of CFM, AIIMS, Bhopal.....Member
8. Mr. Trivesh Goswami, Law Officer, AIIMS Bhopal,.....Member
9. Dr. Shashank Purwar, Professor of Microbiology, AIIMS, Bhopal.....Member Secretary

The decision of the committee is as follows:

The AIIMS, Bhopal IHEC-SR approves your research protocol. All research related activities must begin only after the date of this approval. The validity of this approval is till two years from the date of issuance. Please submit a closure report / renewal request before expiration of the validity for this approval.

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With great thanks

Sandhya Kumari Sinha

ABSTRACT

Introduction: Patient safety is a discipline that emphasize safety culture in health care through the prevention, reduction, reporting and anlyzing of medical and surgical rror that often leads to adverse events.

Objective: To assess the effectiveness of demonstration on knowledge and skill regarding surgical safety among operating room nurses.

Methodology: A post test only design and a quantitative approach was adopted for the study to assess the effectiveness of demonstration regarding surgical safety among 60 operating room nurses, 30 each in experimental and control group at AIIMS Bhopal. Convenient sampling technique was used to select the samples. Demonstration consisting of lecture cum discussion and simulation of surgical safety checklist was administered and the level of knowledge and skill was assessed by using structured knowledge questionnaire and simulation observation checklist.

Results: The mean and SD of knowledge score for the experimental group and control group was 18.53 ±1.25 and 17.1 ±1.77 respectively. The mean and SD of skill score for the experimental group and control group was 23.3 ±1.51 and 20±2.71 respectively. The calculated "r" value among experimental and control group, r=0.53 and 0.75 respectively thus revealed a high statistical significance and a positive moderate correlation between knowledge and skill at $p<0.05$ level.

Conclusion: The study findings revealed that, while comparing the post test level of knowledge and skill showed a significant improvement in experimental group after administration of demonstration which has been devised by the investigator. Hence it was an effective tool to update knowledge and improve the skill of operating room nurses.

Keywords: Patient safety, Surgical safety, Knowledge, Skill, Operating room nurses, Surgical safety checklist

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9	Certificate of validation
10	Master data sheet with key

LIST OF ABBREVIATIONS

Sl. No.	ABBREVIATIONS	EXPANSION
1	WHO	World Health Organization
2	SSC	Surgical Safety Checklist
3	PPT	Power Point Presentation
4	PSP	Patient Safety Practices
5	OR	Operating Room
6	SDM	Shared Decision Making
7	OT	Operation Theatre
8	MoHFW, GOI	Ministry of Health and Family Welfare, Government of India
9	US	United States

CHAPTER 1

INTRODUCTION

CHAPTER 1

INTRODUCTION

Constant attention by a good nurse maybe just as important as a major operation by a surgeon.

- Dag Hammarskjöld

BACKGROUND

Quality should be an inherent trait of all health systems, not just reserved for the privileged or a distant aspiration. Efforts to enhance patient safety have yielded inconsistent results. To improve patient safety in clinical settings, it is crucial to prevent harm and assess the effectiveness of clinical actions using scientific evidence as a standard. Reducing harm to patients is a matter of global concern. Improving patient safety by spreading evidence-based knowledge can reduce harm and death.[1,2,3]

Approximately 10% of in-hospital adverse events are reported, with three-quarters related to surgery; at least 50% of these occurrences are preventable within current standards of care. There are many common surgical errors. They include cutting a nerve during the surgery, making an anesthesia error, cutting the wrong location, operating on the wrong body part, or leaving a sponge or instrument inside the body. Sometimes there is miscommunication, such as an incorrect medication dosage communicated by a surgeon to a nurse, or an incorrect location of the body noted.[4,5]

There is a prevailing attitude among some surgeons that their decisions should not be questioned, particularly by junior staff in the operating room. This can lead to problems when surgeons ignore important feedback from their team members, such as requests for

pertinent images or concerns about the site of surgery. Unfortunately, such failures to listen have resulted in a number of malpractice cases over the years.[6]

Patient Safety

Patient safety involves creating a safety culture in healthcare by implementing processes, procedures, behaviours, technologies, and environments that consistently reduce risks, prevent avoidable harm, minimize errors, and mitigate harm when it occurs.[7]

Patient safety is a primary concern in global health. Surprisingly, the likelihood of someone being harmed during health care is much higher than the likelihood of someone being injured while traveling by plane. Specifically, there is a 1 in 300 chance of a patient being harmed due to medical error, while the probability of being harmed during air travel is much lower at 1 in a million.[8]

The term "medical error" encompasses a wide range of events that vary in their potential to harm the patient. This survey has brought to light a concerning result - more than half (52%) of the respondents believe that the healthcare system is insufficiently equipped to prevent medical errors. The most common reasons cited for these "medical mistakes" were healthcare professionals being "careless or negligent" and being overworked, hurried, or stressed. Medical errors and preventable adverse events are a global problem, not unique to the US.[9]

A study conducted by Professor Jha from Harvard University has revealed that India experiences 5.2 million medical errors every year. In addition, the British Medical Journal has reported that India, like other developing countries, is witnessing a significant number of medical errors. This is primarily due to the lack of training for doctors and nurses on how to measure clinical outcomes.[10]

Surgical Safety

Surgery remains an essential treatment for various conditions, with approximately 312.9 million surgeries performed worldwide each year. All surgical procedures carry a risk of illness or death. Avoidable surgical complications account for a large proportion of preventable medical injuries and deaths globally. Adverse events have been estimated to affect 3-16% of all the hospitalized patients, and more than half of such events are known to be preventable. Safety in surgery requires the reliable execution of multiple necessary steps in care, not just by the surgeon but by a team of healthcare professionals working together for the benefit of the patient.[11,12]

Surgery is often necessary to alleviate disabilities and reduce the risk of death from common conditions. However, unsafe surgical care can cause significant harm. According to the WHO, up to 25% of patients experience complications after inpatient surgeries. Additionally, approximately 50% of all adverse events in hospitalized patients in industrialized countries are related to surgical care.[13] To create a safe OR, staff must anticipate, plan, and prepare for complex work processes. They need experience, coordination, and information reaffirmation to manage different situations. While some are easy to plan for, unexpected situations require teamwork and experience. Surgical teams must conduct safety briefings before a procedure to identify risks and find solutions. Sharing and discussing mental models is key to effective communication and shared goals.[14]

Surgical Safety Checklist

The World Health Organization's Patient Safety Programme developed the 'Safe Surgery Saves Lives' initiative to improve the safety of surgical care worldwide. As part of this program, a SSC was created to ensure that important actions were taken at three natural

'pause points' in the workflow pattern. These pause points occur before the induction of anesthesia, before skin incision, and before the patient leaves the operating room. By adopting this checklist, the team hoped to enhance the safety of surgical procedures and reduce the risk of difficulties.[15] The documents include an oral statement from the surgical team attesting to the fulfillment of several crucial actions necessary to guarantee the safe administration of anesthesia, the prophylactic use of antibiotics, efficient collaboration, and other crucial surgical procedures.[4]

It takes cooperation to make sure that all precautions are taken to guarantee patient safety throughout a surgical procedure. Leadership and teamwork should be prioritized. Even if the operating room has several sub-teams, someone has to oversee their coordination in order to establish a cohesive team where all members are aware of the same information at the same time. The circulating nurse is this coordinator. Teamwork is vital for successful surgeries. The circulating nurse should communicate information to all subteams in the operating room simultaneously to improve patient safety.[16]

A descriptive study conducted by Alisic E et al. (2019) has found that assistant nurses are the most valued and trusted healthcare professionals in the surgical team. This highlights the importance of their role in implementing the WHO Surgical Safety Checklist, which can improve patient safety. Improved understanding of their significance can enhance adherence to the checklist.[17]

A study conducted by Amiri A, Solankallio-Vahteri T, and Tuomi S. (2019) confirmed that there was a significant relationship between nurse staffing to declining surgical complications in OECD countries. Hence improving nursing care quality by increasing staffing levels can reduce surgical complications and negative outcomes. More nurses = better care = fewer complications.[18]

SIGNIFICANCE OR NEED OF THE STUDY

Patient Safety is Everyone's Responsibility.

-MoHFW, GOI

Ensuring patient safety is an essential aspect of healthcare. It refers to the prevention of unnecessary harm or potential harm that may arise during the provision of medical care. Patient safety is one of the key dimensions of quality healthcare, alongside accessibility, acceptability, effectiveness, efficiency, and people-centeredness. It is estimated that around 234 million surgical operations are carried out globally each year. However, surgical care comes with a considerable risk of complications. Although half of the complications associated with surgical care can be prevented, surgical care errors still contribute to a significant burden of disease.

National Patient Safety Implementation Framework (2018-2025) reported the strategic objective "To implement global patient safety campaigns and strengthen Patient Safety across all programs". **Safe surgical care** includes Safe surgery checklist will be adopted for secondary and tertiary care level hospitals to make sure that all elective and emergency surgeries are performed using a safe surgery checklist.[19]

Patient safety is crucial in healthcare, but avoidable adverse events, errors, and risks remain significant challenges. Every year, a significant number of patients experience harm or die due to unsafe healthcare practices, resulting in a high burden of death and disability across the globe, particularly in low- and middle-income nations.

The 74th World Health Assembly adopted the **Global Action Plan in 2021**, with a vision of ensuring that patients receive safe and respectful care, free from harm, every time and everywhere. Strategic objective 1 states that "Make zero avoidable harm to patients a state of mind and a rule of engagement in the planning and delivery of health care everywhere."

Strategic objective 3 that assure the safety of every clinical process. The plan helps countries develop national action plans for patient safety and align existing strategies for better clinical and health-related programs.[7]

A prospective study was conducted by Alex B. Haynes, Thomas G. Weiser, et al (2019) to assess complication rates before and after implementing the WHO checklist. The rate of death decreased from 1.5% to 0.8% after the introduction of the checklist (P=0.003). Inpatient complications occurred in 11.0% of patients initially, decreasing to 7.0% after the introduction of the checklist (P<0.001).[20]

A Large Stepped Wedge Cluster Randomized Controlled Trial conducted by Arvid Steinar Haugen, Hilde Valen Wæhle, et al. concluded that the use of the checklist specifically resulted in improved care processes to protect patients' core body temperature, such as forced air warming blankets, which increased from 35.3 to 42.4% ($P < 0.001$) and more frequent and more timely use of prophylactic antibiotics before incision in 54.5 to 68.5% ($P < 0.001$) of procedures.[21]

In a mixed-method study led by Cecilia Escher and Hans Rystedt, it was found that communication barriers among professionals in operating rooms pose a risk to patient safety. Their research suggests that SBTT (simulation-based team training) can help improve nontechnical skills, foster interprofessional communication, minimize professional barriers, and ultimately enhance patient safety.[22]

A study conducted by Muriel Wyss, Michaela Kolbe, et.al. showed that the WHO Surgical Safety Checklist (SSC) had a positive impact on leadership, teamwork, timing, and acceptance. The effective implementation of the SSC was particularly noted for improving acceptance. Studies show lack of training leads to variation in execution. WHO SSC fosters teamwork and communication, but hurdles impact effectiveness.[23]

Interprofessional teams of clinicians collaborate in the complicated OR environment to deliver dependable and safe patient care. In the OR, where multidisciplinary clinicians impact care through overlapping but separate duties, collaboration is crucial. An increasing amount of research relates multilayered outcomes like patient experience, clinical patient outcomes, and the quality and safety of care to cooperation and collaboration. Shorter total operating times, team member safety, fewer surgical errors and delays, fewer misunderstandings, and fewer readmissions of patients have all been linked to surgical team familiarity.[24]

The concept of patient safety is a significant health concern within the health care delivery system, hence the surgical environment should encompass of a higher level of standardization and safety process to decrease human mistakes.

The researcher believes that implementing the World Health Organization's surgical safety checklist is necessary. They argue that having knowledge about surgical safety is a crucial step towards improving patient safety in the healthcare system. It will also boost the self-esteem of healthcare professionals and encourage them to advocate for their patients by preventing harmful outcomes.

PROBLEM STATEMENT

A study to assess the effectiveness of demonstration on the knowledge and skill regarding surgical safety among operating room nurses working at AIIMS Bhopal.

RESEARCH QUESTIONS

1. Is there any effectiveness of demonstration regarding surgical safety on knowledge and skill among operating room nurses between experimental and control group?

2. Is there any correlation between post-test knowledge score and skill score among operating room nurses in experimental and control group?
3. Is there any association between selected demographic variables and post-test knowledge and skill score among operating room nurses in experimental and control group?

AIMS AND OBJECTIVES

Aim of the study

The aim of the study is to assess the effectiveness of demonstration on the knowledge and skill regarding surgical safety among operating room nurses working at AIIMS Bhopal.

Objectives of the study

1. To assess the effectiveness of demonstration regarding surgical safety on knowledge and skill among operating room nurses between experimental and control group.
2. To correlate the post test mean knowledge scores with skill scores among operating room nurses in experimental and control group.
3. To find the association between selected sociodemographic variables with post test of knowledge and skill scores among operating room nurses in experimental and control group.

HYPOTHESIS

$H0_1$: There is no significant difference in the post test level of knowledge and skill among operating room nurses between experimental and control group.

$H0_2$: There is no significant correlation between the post test level of knowledge and skill among operating room nurses in experimental and control group.

$H0_3$: There is no significant association between selected demographic variables and post test scores of knowledge and skill among operating room nurses in experimental and control group.

OPERATIONAL DEFINITION

- **Effectiveness:** Effectiveness means the increase in level of knowledge and skills among operating room nurses which will be assessed by a structured knowledge questionnaire and an observational checklist respectively within the study period.
- **Demonstration**: In this study, demonstration is an intervention developed by the researcher which will include two sections, lecture cum discussion and simulation. In lecture cum discussion 20 minutes of comprehensive lecture will be delivered regarding definition, purposes, members involved in the team and advantages of performing Surgical Safety Checklist by WHO using PPT. In simulation, 10 minutes of activity will be performed, that is designed by the researcher to reflect the real situation of performing WHO's Surgical Safety Checklist by assigning roles and responsibilities of the nursing officer.
- **Surgical safety**: In this study, surgical safety defined as safety of patient during any surgical procedure through prevention, reduction, reporting and analysis of error that often leads to adverse patient events which will be assessed by Surgical Safety Checklist by WHO.
- **Knowledge**: It refers to the state of knowing regarding surgical safety among operating room nurses, evaluated at 7^{th} day after giving the intervention using a structured questionnaire which is devised by the investigator.
- **Skill**: It refers to the capability of the operating room nurses to perform simulation regarding surgical safety, evaluated after one week of intervention by using

Simulation observation checklist, devised by the investigator based on WHO's surgical safety.

- **Operating room nurses**: It refers to the registered nurse working as circulatory or scrub nurse in operation theatre.

DELIMITATION

The study is delimited to registered nurses working in the operation theatre of AIIMS Bhopal.

CONCEPTUAL FRAMEWORK

A conceptual framework is a visual or written product that explains either graphically or in narrative form, the main things to be studied, the key factors, concepts, or variables and the presumed relationships among them.[25]

The current study aimed at developing and evaluating the effectiveness of the demonstration on knowledge and skill among operating room nurses working at AIIMS Bhopal. The research investigator had adopted conceptual framework developed by a biologist Ludwig von Bertalanffy in 1969. General system theory is mainly interested in the functioning of systems; it unifies a wide variety of systems by defining and identifying the common patterns and processes that they all share.

Input

It is an open system that exchanges energy with the environment and continually attempts to adapt in a holistic manner.

In the present study it refers to the assessment of demographic variables of operating room nurses.

Process

It involves organizing input information and transforming system energies to facilitate easy recognition and response.

It denotes the administration of 9-10 operating room nurses in group, thereby improving knowledge and skill regarding surgical safety in operating room. Here the investigator executed the demonstration through lecture cum discussion and simulation on surgical safety. The operating room nurses were evaluated after one week of intervention by using Simulation observation checklist, devised by the investigator based on WHO's surgical safety.

Output

After processing the input, the system returns output to the environment in the form of practising the intervention in their daily lives.

In this study, the investigator assess the post-test level of knowledge and skill regarding surgical safety among operating room nurses using structured knowledge questionnaire for knowledge and observation checklist for skill. If there adequate and moderately adequate knowledge, good and fair skill, this will help the operating room nurses in adjusting well to practice timeout procedure as their daily routine and knowledge and skill can be enhanced.

Feedback

It refers as an internal information about the system functioning as a corrective device. Feedback is not included in this study.

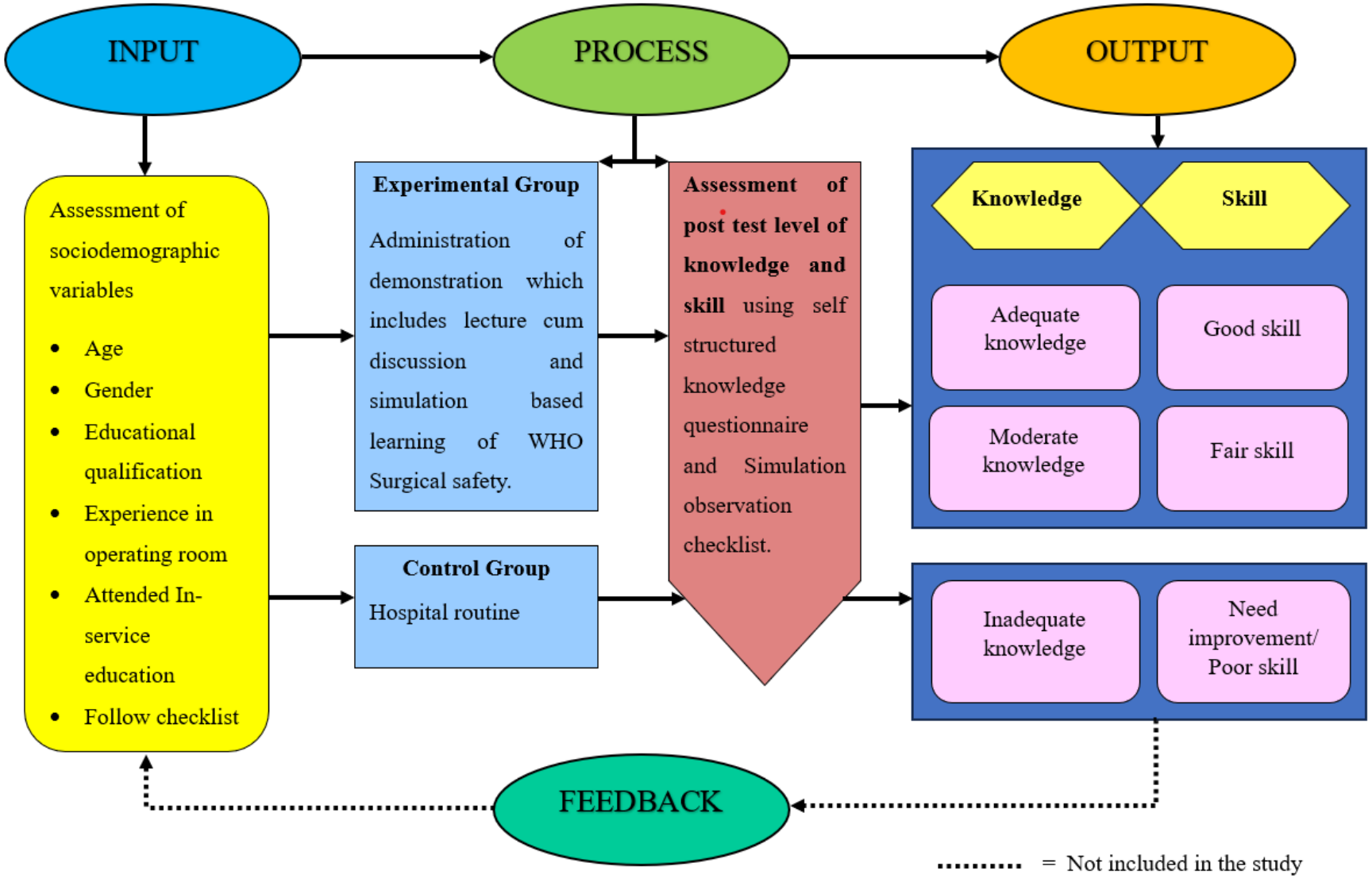

Figure 1: Conceptual framework based on General System Theory (1969)

Summary of the chapter

Patient safety is a primary concern in global health. Surgery remains an essential treatment for various conditions, with approximately 312.9 million surgeries performed worldwide each year. The World Health Organization's Patient Safety Programme developed the 'Safe Surgery Saves Lives' initiative to improve the safety of surgical care worldwide. Surgical Safety Checklist was created to ensure that important actions were taken at three natural 'pause points' in the workflow pattern. These pause points occur before the induction of anesthesia, before skin incision, and before the patient leaves the operating room. By using this checklist, the team aimed to enhance the safety of surgical procedures and reduce the risk of complications.

CHAPTER 2

REVIEW OF LITERATURE

CHAPTER 2

REVIEW OF LITERATURE

A literature review is a body of test that aims to review the critical points of knowledge on a particular topic of research. It helps to lay the foundation for the study and also inspire new research ideas.[25]

Review of literature is an evaluative repost of information found in the literature related to selected area of study. The review describes, summarizes, evaluates and clarifies this literature. It gives a theoretical base for the research and helps to determine the nature of research.[26]

The search terms used for the literature review were- patient safety, surgical safety, checklist, surgical safety checklist, medical errors and nursing officers.

To gain a thorough grasp and insight into the study subject, the researcher critically analyzed a large number of publications pertaining to the topic from books, published articles in print, and electronic sources including PubMed, Google Scholar, and other well-known scientific websites.

Literature related to patient safety

A report analysed by Sheedy C, and Richard S.[27] in 2020 conducted a thorough literature search by identifying PSP-specific search terms and filtering for English publications only between 2008 and 2018 in the MEDLINE and CINHAL databases. It analysed the evidence for various patient safety practices (PSPs) and factors that contribute to their successful implementation. The report covers five major threats to safety, including medication management issues, healthcare-associated infections, nursing sensitive events, procedural events, and diagnostic errors. In total, 47 PSPs were reviewed in 17

specific harm areas. In addition to these specific practices, the report also delves into cross-cutting practices that can improve patient safety. These include improving safety culture, teamwork and team training, clinical decision support, person and family engagement, cultural and linguistic competency, staff education and training, as well as data monitoring, audit, and feedback. Overall, the report provides valuable insights into the various PSPs that can be implemented to improve patient safety, and the factors that can contribute to their successful implementation and adoption.

A review article was published by Haugen AS, Sevdalis N and Softeland E.[28] in 2019 to assess the effectiveness of the World Health Organization Surgical Safety Checklist in improving patient safety. It shows the successful implementation of the checklist requires a certain level of flexibility to ensure that surgical teams execute critical tasks and care processes for every patient. The researchers concluded that in order to positively impact patient safety, the use of checklists in anesthesia and surgery must enhance our work processes within the operating room.

A descriptive study was conducted by Linda Emanuel[29] et al. in 2008, defined patient safety as a discipline in healthcare that applies safety science methods to achieve a dependable healthcare delivery system. This study focus for improving safety in healthcare is the microsystem, and the key mechanisms for achieving this are high-reliability design and the use of safety sciences and other methods to drive improvement, including cultural change. It identify certain key attributes of those individuals who practice safety, and they contend that all healthcare professionals should consider themselves to be practitioners of safety.

Literature related to role of nurse in surgical safety

A descriptive study was conducted by Young R, Shaughnessy MF.[16] in 2022 to improve patient safety and expedite the surgery process, this review will examine the role of the circulating nurse and their duties and responsibilities. It is crucial to work as a team to achieve successful surgical outcomes. To improve patient safety during surgical procedures, it is essential to designate the circulating nurse as the person responsible for preparing and ensuring that all sub teams within the operating room are aware of the same information at the same time. The use of peri-operative checklists can help ensure that all identified areas are addressed.

A qualitative exploratory study was conducted by Goras C[14] et al. in 2020 to investigate the collaborative efforts between registered nurse anaesthetists, operating room nurses, and surgeons in managing complexity and ensuring safe treatment in the OR. Three main categories that can help in creating a safe environment for patients in the operating room. These categories are: preconditions and resources, planning and preparation for expected and unexpected situations, and adapting to unexpected changes. There is a subcategory in each of these areas that is shared by the three professions. These subcategories include organizing and verifying data, planning the patient's care and preparing mentally, and setting priorities and addressing impending issues, in that order.

An Institution based Cross- Sectional study was conducted by Sharma SK[30] et al. in 2020 to evaluate the perioperative nurses' knowledge and attitudes regarding the use of the WHO Surgical Safety Checklist (SSC) and to ascertain the relationship between these factors and the chosen sociodemographic variables of the perioperative nurses. Nurses are much more aware of and have a more favourable attitude on the usage of WHO SSC; in order to ensure patient safety, major surgical problems must be avoided.

A descriptive study conducted by Alisic E[17] et al. in 2019 in Sweden to reduce surgical errors and complications, promote safer surgical practices and outline the role of assistant nurses in implementing the checklist. The assistant nurses have the lowest level of education among healthcare professionals, they are highly trusted and valued by other members of the surgical team. However, most healthcare professionals are unsure about who is responsible for using the WHO checklist, but believe that it is the assistant nurse's responsibility to ensure its implementation. Assistant nurses were found to be the most valued and trusted healthcare professionals in surgical teams. Improving their understanding of the importance of the WHO SSC could enhance adherence and improve patient safety.

A study conducted by Amiri A, Solankallio-Vahteri T, and Tuomi S.[18] in 2019 in Finland to investigate the impact of nurse staffing on patient safety by reducing surgical complications in OECD (Organization for Economic Co-operation and Development) member countries. The OECD countries with a higher proportion of nurses have demonstrated better patient safety outcomes, including lower rates of surgical complications and adverse clinical outcomes. This finding highlights the importance of nurses in improving the quality of healthcare services and underscores the potential risks of underestimating their impact. The study's authors urge policy makers to recognize and prioritize the crucial role of nurses in enhancing patient safety and overall healthcare quality.

A descriptive and cross-sectional study was conducted by Kisacik OG and Cigerci Y[31] in 2019 To find out use of the Surgical Safety Checklist (SSC) in operating rooms and the attitudes of operating room nurses regarding it. It was discovered that all operating room nurses were aware of the SSC and agreed that it was essential. But the majority of participants said that the operating room did not successfully apply the SSC. The

study demonstrate the need for adjustments centered on fostering a patient safety (PS) culture and teamwork in operating rooms in order to use SSC correctly and consistently.

Literature related to educational program

A mixed-method intervention study was conducted by Cecilia Escher[32] et al. in 2023 to examine the effectiveness of a course that aimed to improve the teamwork skills of operating room professionals. The study used a mixed-method approach to evaluate the participants' motivation and self-efficacy after the training, as well as their ability to apply the lessons learned in their workplace. The training was a full-day simulation-based course, which was attended by 71 professionals. All of the participants reported an increase in their self-efficacy and intrinsic motivation after the training. The study concludes that this type of training is feasible for professional teams and has promising opportunities for improving teamwork skills. However, the qualitative data revealed both opportunities and limitations for transferring the learning experiences to the workplace.

An observational clinical audit was conducted by Gul F.[33] et al. in 2022 to evaluate adherence to the World Health Organization's (WHO) Surgical Safety Checklist (SSC) and investigate the challenges associated with appropriately applying the SSC in tertiary care hospitals' operating rooms. It took place in Pakistan's Benazir Bhutto Hospital's Surgical Unit I in Rawalpindi. Before and after the educational intervention, there was evidence of adherence to the surgical safety checklist. Following an educational intervention, there was an improvement in compliance with every step of the surgical safety checklist. Of these, the Sign-out step "Count of sponges and needles & instruments complete?" showed the largest improvement in compliance (66.7%). By putting the

surgical safety checklist into practice, you may enhance patient safety protocols while also fostering a culture of cooperation and improvement within the department.

A study conducted by Shawn L. Mincer[34] et al. in 2017 aimed to identify barriers and solutions in implementing Shared Decision Making (SDM) in healthcare. Effective communication is a crucial component of safe and high-quality healthcare. However, there are several barriers to implementing SDM, including the adoption and dissemination of patient activation materials and decision aids, concerns about increased time commitments, and surgeons' beliefs that they were already practicing SDM. The study concluded that successful implementation of SDM requires a process to engage stakeholders, identify barriers, and develop interventions to overcome those barriers. This may include novel teaching strategies and data-driven individual feedback to support the adoption of SDM in clinical practice. The study emphasized the need for a collaborative approach involving all stakeholders to overcome the barriers and ensure that SDM is implemented effectively in healthcare settings. Overall, the study highlights the importance of effective communication and collaboration among healthcare providers to ensure that SDM is implemented effectively. It also emphasizes the need for ongoing education and training to overcome any barriers that may arise in the process of implementing SDM.

A controlled interrupted time series study was conducted by Lauren Morgan[35] et al. in 2014 in 3 operating theatres in a UK district general hospital to assess the efficacy of aviation-style teamwork training in enhancing team performance and clinical outcomes in the operating theatre. A one-day team training course was provided for all staff, followed by six weeks of weekly in-service coaching to reinforce learning. The study revealed that teamwork training had a positive impact on team non-technical skills, but it caused a slight increase in complications and decline in technical performance compared

to the control group. The compliance with the WHO checklist procedures improved significantly, but it improved equally in the control group who did not receive any training.

Literature related to surgical safety checklist

A survey was conducted by Gong J[36] et al. in 2021 to take a look at what influences gynaecologists, anesthesiologists, and operating room registered nurses' (OR-RNs') satisfaction with the use of SSC. Satisfaction with the execution of SSC was influenced by several factors. These factors may mostly be associated with high workloads and insufficient expertise in SSC implementation. Reducing the excessive workloads of surgical team members and developing their comprehension of the significance of SSC implementation is advised in order to improve surgical team members' happiness with SSC implementation and enable SSC completion compliance.

A systematic review and meta-analysis conducted by Michelle C. White[37] et al. in 2021 to identify the implementation strategies used in the World Health Organisation Surgical Safety Checklist (SSC) uptake in low- and middle-income countries (LMICs). The aim of the study was to examine any association of implementation strategies with implementation effectiveness, and to assess the clinical impact. They screened 1562 citations and included 47 papers in their analysis. The use of SSC was associated with a reduction in mortality (RR 0.77; 95%CI 0.67-0.89), all complications (RR 0.56; 95%CI 0.45-0.71) and infectious complications (RR 0.44; 95%CI 0.37-0.52). The study concluded that the SSC is used with high fidelity, and it is associated with improved clinical outcomes in LMICs. The global surgical community needs to apply implementation science methodology further.

A cross-sectional study was conducted by Uprety A[38] et al. in 2021 among healthcare workers in the operating room at the Tribhuvan University Teaching Hospital (TUTH) in Kathmandu, Nepal. They were surveyed to gather information specific to their country about the checklist in a prestigious medical facility. The WHO SSC was known to the majority of healthcare professionals, but there were a number of obstacles to using the checklist. Establishing an efficient use of WHO SSC in the operating room is crucial.

A prospective observational study was conducted by White MC[1] et al. in 2020 examines a model of the national World Health Organization (WHO) Surgical Safety Checklist implementation in Cameroon using the knowledge to action implementation methodology. Based on information from high- and low-income nations, Cameroon is classified as a lower-middle-income nation. Effective checklist implementation in a lower-middle-income nation like Cameroon is linked to a diversified implementation strategy, which implies that a theoretical framework can be implemented.

A qualitative study was conducted by Harris K[39] et al. in 2020 to determine the risk factors that patients and medical professionals believe should be on a surgical patient safety checklist that is patient-driven. Pre-operative information, which includes pre-operative planning, post-operative information, post-operative plans, and follow-up, was used to classify safety risk factors. There was a wide range of risk factors found for a patient safety checklist. Based on these risk factors, a surgical safety checklist might be created to help minimize complications and unintentional mistakes.

A descriptive, cross-sectional study was conducted by Sharma P, Tripathi V, Gupta U[40] in 2020 to assess the participant's knowledge, attitudes, and practices on the SSC and identify any potential implementation issues. Hospital staff members have a high level of

awareness of the SSC and support current patient safety policies. By using the surgical safety checklist, a strategy focused on appropriate teaching, gradual adoption, removing obstacles, and providing regular feedback can reduce surgery-related problems and morbidities.

A prospective observational study conducted by Ajitha and Pravalika[41] in 2019 in to evaluate the use and attitude of operating room staff towards the Surgical Safety Checklist. The study included 262 surgeries in the department of general surgery, out of which only 16.03% of checklists were fully completed, 55.72% were partially completed, and 28.2% of checklists were not completed at all. The research concluded that over 80% of people believed that using a checklist could reduce the likelihood of human error. Lack of training and assertiveness were found to be the main barriers to checklist usage. Appropriate utilization and compliance of Surgical Safety Checklist is dependent on the training of staff. Proper training of the surgical team members is crucial for the effective implementation of the Surgical Safety Checklist. It can help ensure that the checklist is utilized appropriately and that compliance remains high, leading to improved patient safety outcomes.

A cohort study was conducted by Ramsay G.[11] et al. in 2019 To find out whether the surgical checklist's implementation—along with a unit-based partnership and a national-level improvement strategy—had an effect on the population's outcomes following surgery in Scotland. As part of a national patient safety campaign, it discovered that the introduction and application of the WHO surgical checklist resulted in a significant decrease in the death rates of patients receiving surgical intervention in Scotland. A similar improving trend was not seen in the cohort that did not have surgery.

A mixed method observational study was conducted by Rene Schwendimann[43] et al. in 2017 To determine if the surgical department at Basel University Hospital in Switzerland is adhering to the WHO surgical safety criteria. Data was collected via individual structured interviews and on-site non-participant observations. The study concluded that the Team Time Out was applied consistently and correctly, While the most frequent cause of omission or insufficient use of the Team was the absence of critical operating room team members at sign-out time Exit.

A study was conducted by Gerald Sendlhofer[44] et.al. in 2017 to analyse compliance, The study aimed to evaluate the effectiveness of the adapted World Health Organization Surgical Safety Checklist (SSC) in improving surgical safety. A total of 305 operations were observed, 175 in test run 1 and 130 in test run 2. The completion rates within used SSCs were 36.3% in test run 1 and 1.6% in test run 2. After the implementation of the SSC, three unannounced audits were conducted, which showed that the SSC was used in 95.3%, 91.9%, and 89.9% of the surgeries. However, the completion rates decreased from 81.7% to 60.6% and 53.2% within used SSCs. The study concluded that the implementation of new tools such as the adapted WHO SSC requires constant supervision and instruction until it becomes self-evident and accepted. Further efforts, mainly hands-on leadership and training, are necessary to ensure the effective implementation of the SSC.

A Systematic review and meta-analysis was conducted by Bergs J[4] et al. in 2014 to assess the available data at the time on how well this checklist works to prevent surgical complications. Although the evidence is strongly indicative of a decrease in mortality and postoperative complications after the WHO SSC was implemented, it cannot be considered conclusive in the lack of higher-quality trials.

An observational study was conducted by Stephane Cullati[45] et al. in 2013 which aimed to determine whether the items on the Time Out and the Sign Out of the Surgical Safety Checklist are properly checked by operating room (OR) staff and whether the number of checked items is influenced by the severity of the intervention and the use of the checklist as a memory tool during the Time Out and the Sign Out periods. Main outcome was to assess whether each item of the Time Out and the Sign Out checklists had been checked and validated by at least one member of the team. The secondary outcome was the number of validated items during the Time Out and the Sign Out. The study concluded that proper training on the completion of the checklist must be provided to OR teams as the severity of the interventions influenced the number of items properly checked. This study highlights the importance of proper training and education for OR staff to ensure the effectiveness of the Surgical Safety Checklist. It emphasizes that even though the checklist is a valuable tool for improving patient safety, it is essential to ensure that all items are checked and validated by the team to maximize its benefits.

A Prospective Randomized Controlled Study was conducted by Neeraj Chaudhary[46] et al. in 2012 to evaluate the effect of checklists on postoperative outcomes among 700 consecutive patients who underwent operations. The study discovered that the Experimental group had significantly lower postoperative wound-related ($p = 0.04$), abdominal ($p = 0.01$), and bleeding ($p = 0.03$) complications compared to the Control group. Additionally, the Experimental group had a significant decrease in mortality ($p = 0.04$). The study concluded that the number of overall and higher-grade complications per patient was higher in the group that had incomplete checklists compared to the group with fully completed checklists. The implementation of the WHO surgical safety checklist resulted in a reduction in mortality and improved postoperative outcomes in a tertiary care hospital in a developing country.

A descriptive study was conducted by S. P. Pickering[47] et al. in 2011 to evaluate the compliance and use of the WHO checklist. The study observed 294 operations across 5 NHS and 4 surgical specialties. The results showed that time-out was attempted in 257 operations (87.4%), while sign-out was attempted in 26 operations (8.8%). The frequency of time-out and sign-out attempts was not affected by surgical speciality (p=0.45). The study found that time-out frequency, the information communicated, all team members' presence, and active participation varied between hospitals (p<0.001) for all. The study concluded that meaningful compliance with the WHO Surgical Safety Checklist is much lower than what administrative data suggests. There is variation between hospitals, but consistency across studied specialties, indicating a need to address organizational cultural issues.

A descriptive study was conducted by Aude Fourcade[48] et al. in 2010 to identify the barriers that prevent the effective implementation of a surgical checklist and to develop a strategy for its best use. The study was carried out in 18 cancer centres in France, and it included 1440 surgical procedures. The mean compliance rate of the checklist was found to be 90.2%, with a mean completion rate of 61%. The researchers identified 11 barriers that hindered the successful implementation of the checklist. The main barriers were duplication of items within the existing checklist, poor communication between the surgeon and anaesthetist, time spent completing the checklist for no perceived benefit, and a lack of understanding and timing of the item checks. The researchers concluded that the successful implementation of the checklist depends on organizational and cultural factors within each centre.

A prospective study was conducted by Alex B. Haynes[20] et al. in 2009 in eight hospitals located in eight cities across the world to reduce the morbidity and mortality in a global population by application of a 19-item surgical safety checklist. The overall in-hospital

death rate decreased from 1.5% to 0.8% (P = 0.003), and the rate of any complication at all sites decreased from 11% at baseline to 7.0% following the implementation of the checklist (P<0.001). Additionally, there was a significant drop in the overall rates of surgical-site infection and unplanned reoperation (P<0.001 and P = 0.047, respectively). The study stated that the checklist's adoption was linked to concurrent drops in the death and complications rates of patients who were at least 16 years old and having non-cardiac surgery across a variety of institutions.

Summary of the chapter

This chapter deals with the review of literature. By reviewing different literature, it is evident that patient safety is one of the key dimensions of quality healthcare. The implementation of the checklist was associated with reductions in the rates of death and complications among patient. Hands-on leadership and training, are necessary to ensure the effective implementation of the SSC.

CHAPTER 3

MATERIALS AND METHODS

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“Research methodology is the systematic way to solve problems. It includes the steps that the researcher adopts to study his problems with the logic behind it” (Kothari, 1990). It shows the overall structure for arranging the process of obtaining accurate and trustworthy data for an intervention.

A brief explanation of the methodology used by the researcher to carry out this investigation is given in this chapter. The research methodology, research design, study setting, sample, and sampling procedure are all included in this chapter. It also covers the tool's creation, data gathering protocol, and data analysis strategy.

RESEARCH APPROACH

Quantitative approach

RESEARCH DESIGN

Quasi experimental research design, Post-test only design was adopted for this study as conducting a pretest could have created pretest bias among the study and control group. Therefore, the researcher opted for a post-test only control group design. In this study, the participants were allocated into two groups. The experimental group received intervention and the control group did not receive any intervention.

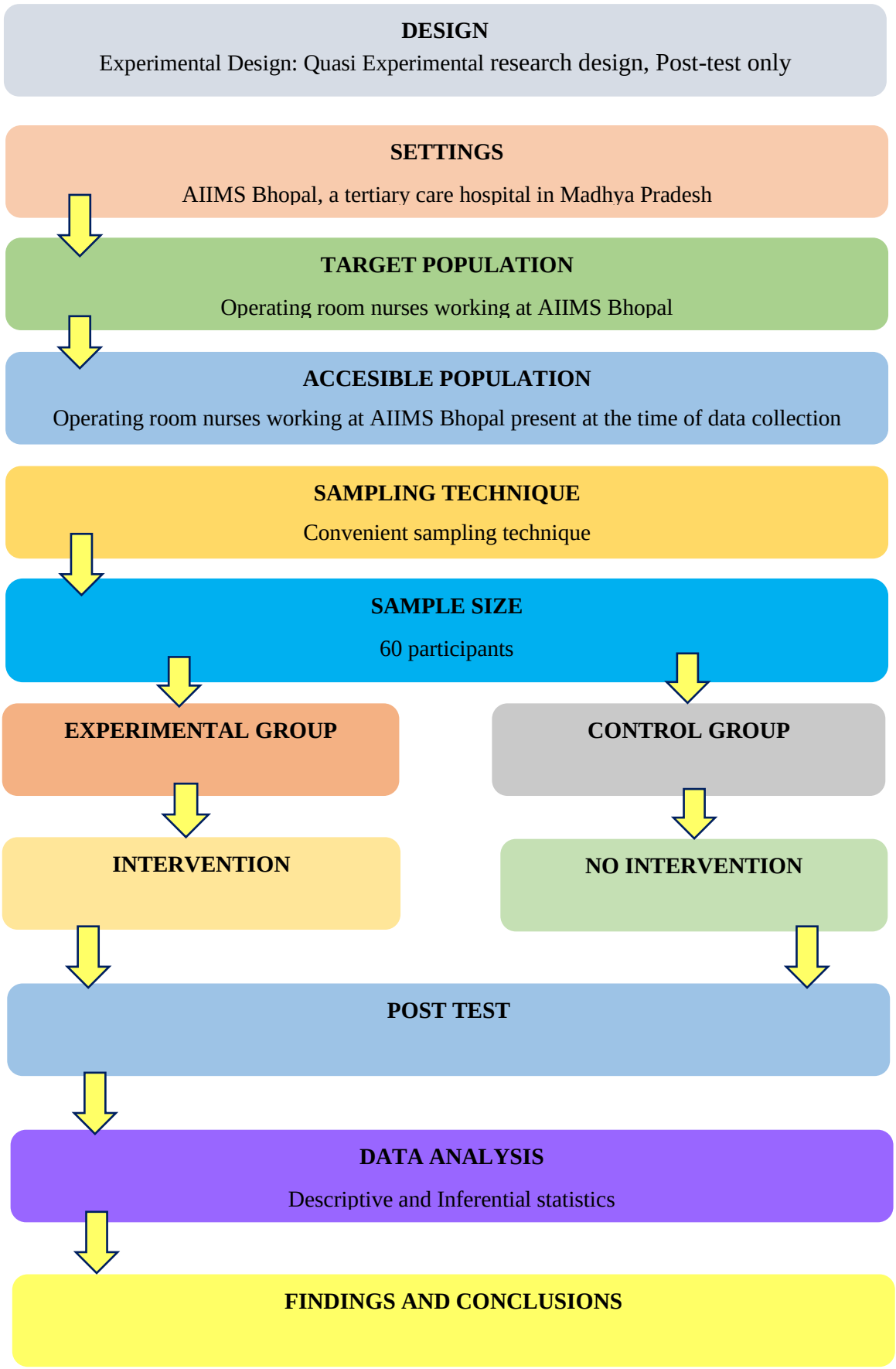

Figure 2: The schematic representation of research design

RESEARCH VARIABLES

i. **Research variables**

Independent variables: Demonstration and simulation regarding surgical safety

Dependent variables: Knowledge and skill regarding surgical safety

ii. **Sociodemographic variables:** Age (in years), gender, educational qualification, experience in operating room, attended in-service education on Surgical Safety Checklist given by WHO within or before 6 months of duration, do you follow WHO's surgical safety checklist. (6 Items)

RESEARCH SETTING

The research setting of this study was AIIMS Bhopal, a tertiary care hospital in Madhya Pradesh which provide a wide variety and range of care to the patient and educational institute.

POPULATION

Operating room nurses who will be available at the time of data collection.

SAMPLE

- **Inclusion criteria:**
  - Registered operating room nurses working at AIIMS Bhopal.
  - Operating room nurses who are available at the time of data collection
  - Operating room nurses who can read and write English.
- **Exclusion criteria:** Operating room nurses who are not willing to participate in the study.

SAMPLE SIZE

The sample size is calculated using the previous study titled "Effectiveness of time out procedure protocol on knowledge and skill regarding patient safety among operating room nurses at selected hospitals", the mean difference and SD of primary outcome measure (knowledge) in intervention group was 14.60 ± 2.66. [49]

$$n \geq \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 \ (\sigma_1^2 + \sigma_2^2 / r)}{(\mu_1 - \mu_2)^2}$$

$n = (1.96+0.80)^2 \ (7.07 + 3.72) / (14.60 – 9.40)^2$

$= 7.61*10.79/27.04$

= 4 in each group

N= 8

Attrition rate = 10%, i.e., (8*0.1)

So, required sample size = 9

Alpha (α): type 1 error rate Beta (β): Type 2 error rate

μ1: Expected mean of the outcome in group 1

σ1: Expected standard deviation of the outcome in group 1

μ2: Expected mean of the outcome in group 2

σ2: Expected standard deviation of the outcome in group 2

r: Sample size ratio Group 2/ Group 1

For current study sample size of 60 operating nurses was taken (30 each in the experimental and control group) who fulfil the inclusion criteria.

SAMPLING TECHNIQUE

Convenience sampling technique was used to select participants for the study.

DATA COLLECTION TOOLS

i. Development and description of tool

The following steps were undertaken in tool development:

1. Extensive review of literature regarding surgical safety and surgical safety checklist.
2. Development of socio demographic sheet based on literature review.
3. Content validation (Annexure No: 8)
4. Tool modification based on the suggestions of guide, co-guide and experts. (Annexure No: 3,4)
5. Reliability testing
6. Finalization of tool

Section 1- Questionnaire to assess Socio demographic data

This included 6 items namely, age, gender, educational qualification, experience in operating room, attended in-service education on Surgical Safety Checklist given by WHO within or before 6 months of duration, do you follow WHO's surgical safety checklist.

Section 2- Self-structured Knowledge questionnaire to assess the knowledge regarding surgical safety among operating room nurses.

- Contains 20 items with a score 0-1 for each item (Incorrect-0, Correct-1)
- Scoring will range from 0-20

Scoring key:

Each correct answer was given '1' mark, and wrong answers and unattended question was given '0' mark. The score was then converted into percentage to interpret the level of knowledge, the overall score was 20, maximum score was 20 and the minimum score will be 0.

Interpretation of knowledge:

The level of knowledge will be categorized as

Score	Level of knowledge
<11	Inadequate level of knowledge
11-15	Moderate level of knowledge
16-20	Adequate level of knowledge

Section 3- Simulation Observation Checklist

- This part consists of structured checklist based on WHO's Surgical Safety Checklist.
- The checklist is divided in three sections:
  - Before induction of anaesthesia (Sign in)
  - Before skin incision (Time out)
  - Before patient leaves operating room (Sign out)
- Contains 25 items with a score 0-1 for each item (Incorrect-0, Correct-1)
- Scoring will range from 0-25

Scoring key:

Each correct answer was given '1' mark, and wrong answers and unattended question was given '0' mark. The score was then converted into percentage to interpret the level of knowledge, the overall score was 25, maximum score was 25 and the minimum score will be 0.

Interpretation of skill:

The level of knowledge will be categorized as

Score	Level of skill
<11	Poor skill
11-15	Need improvement
16-20	Fair skill
21-25	Good skill

Section 4- Intervention tool

The intervention tool prepared by the investigator is demonstration consisting of

- Lecture cum discussion on Surgical Safety Checklist with the help of Power Point Presentation
- Simulation performing Surgical Safety Checklist

ii. Validity and reliability of tool

Validity

Content validity of the tool was obtained from 10 experts in the field of nursing and medicine. (Annexure No: 7)

Individual item Content Validity Index (I-CVI) was calculated by taking the option of score 3 and 4 (highly relevant and quite relevant) and Scale-Content Validity Index (S-CVI) calculated by taking the average of I-CVI.

Acceptable range of I-CVI was 0.78 or above and S-CVI is 0.90 or above.

- All items in Socio demographic sheet are having I-CVI greater than or equal to 0.90 and S-CVI 0.96.
- All items in Self-structured Knowledge questionnaire are having I-CVI greater than or equal to 0.90 and S-CVI 0.98.
- All items in Simulation observation checklist are having I-CVI greater than or equal to 0.90 and S-CVI 0.98.
- All items in Lesson plan for surgical safety checklist are having I-CVI greater than or equal to 0.90 and S-CVI 0.97.
- All items in Simulation script for surgical safety checklist are having I-CVI greater than or equal to 0.90 and S-CVI 0.98.

Suggestions of experts were incorporated and the study tool was finalized.

Reliability

In current setting reliability of Self-structured Knowledge questionnaire was established by test-retest method on 10 study participants (r = 0.76) and by split half method on 10 study participants (r = 0.88).

In current setting reliability of Simulation observation checklist established by Inter Rater method on 10 study participants (r = 0.82).

iii. Technique of data collection

Data was collected by questionnaire method. The participants filled the questionnaire by themselves. Simulation observation checklist was filled by the investigator based on the performance of the participant.

Description of intervention

Intervention protocol was developed based on the books and literature review. The intervention protocol included Power Point Presentation and Simulation regarding Surgical Safety. The lesson plan (Annexure No: 4) and content (Annexure No: 4) for simulation was validated by the experts and modification was done on the basis of suggestions of experts, guide and co-guide and after that it was finalized.

The investigator administered the intervention through a lecture cum discussion (20 mins) using Power Point presentation and simulation (10 min) on surgical safety in operating room. The investigator explained in detail about the definition, objectives, components of the surgical safety checklist, phases of the checklist and advantages of using the checklist using powerpoint presentation. Simulation designed by the researcher to reflect the real situation of performing WHO's Surgical Safety Checklist by assigning roles and responsibilities of the nursing officer with the other few M.Sc. Nursing students. It took 30 minutes to complete the powerpoint presentation and the simulation.

Ethical Consideration

Ethical clearance was obtained from Institutional Human Ethical Committee (Ref Number: AIIMS/BPL/IHECSR/July/22/MscN/05) and permission to conduct study obtained from concerned hospital authority. Written informed consent (Annexure No: 6) obtained from the participants after giving participant information sheet (Annexure No: 5) having full disclosure regarding study participation.

Confidentiality of information, voluntary participation and right to withdraw at any point of study was assured.

Pilot study

Pilot study was conducted in Trauma Operation theatre AIIMS Bhopal for a period from 20/9/23 to 28/9/23 after getting formal permission from Medical Superintendent of the hospital. Eight participants who met the eligibility criteria after screening phase, were selected conveniently and were randomly allocated to experimental and control group. Informed consent was obtained from the OR nurses after thorough and clear explanation of the intervention by the investigator. Intervention was provided by the researcher to the experimental group.

On the 1st day the OR nurses in the experimental group were gathered and seated comfortably in a well ventilated room. Demographic details were obtained from the samples through socio-demographic tool. The investigator administered the intervention regarding surgical safety in OR, through lecture cum discussion for 20 mins and simulation performed by the investigator for 10 mins. After 7 days, the post test was conducted using same tool for both the experimental and control group. It was concluded that By comparing mean knowledge scores there is a significant difference in the post test level of knowledge and skill among operating room nurses between experimental and control group.

There is a no significant association between selected Sociodemographic variables and post test scores of Knowledge and Skill among operating room nurses in experimental and control group at level of significance 0.05.

During pilot study practicability of the tool, feasibility of the study and efficiency of intervention was assessed and revealed as feasible, practical and efficient intervention.

Procedure for data collection

The main data collection period was from 29/9/23 to 28/10/23. The investigator assigned the Modular OT 2nd floor as experimental group and Modular OT 3rd floor as control group. The researcher screened the operating room nurses based on the inclusion and exclusion criteria using convenient sampling technique 60 OR nurses (30 OR nurses in each group) were selected as samples.

The investigator organized a timing schedule to meet the operating room nurses during their morning shifts. The investigator seek formal permission from the Medical Superintendent of the hospital and seated the investigator in a well ventilated and lighted room which was allotted to the investigator, introduced about self and briefly explained regarding the purpose of the study. After obtaining a written consent from the OR nurses and the pledge of confidentiality, participant information sheet was given. Then their socio demographic variables were collected using a structured questionnaire on the same day, intervention was administered to the experimental group. The samples were assigned with identity numbers to maintain their confidentiality.

On the 7th day, the post test level of knowledge and skill was assessed using structured knowledge questionnaire and simulation observation checklist for both the groups. All ethical principles were adhered by the research investigator throughout the course of the study.

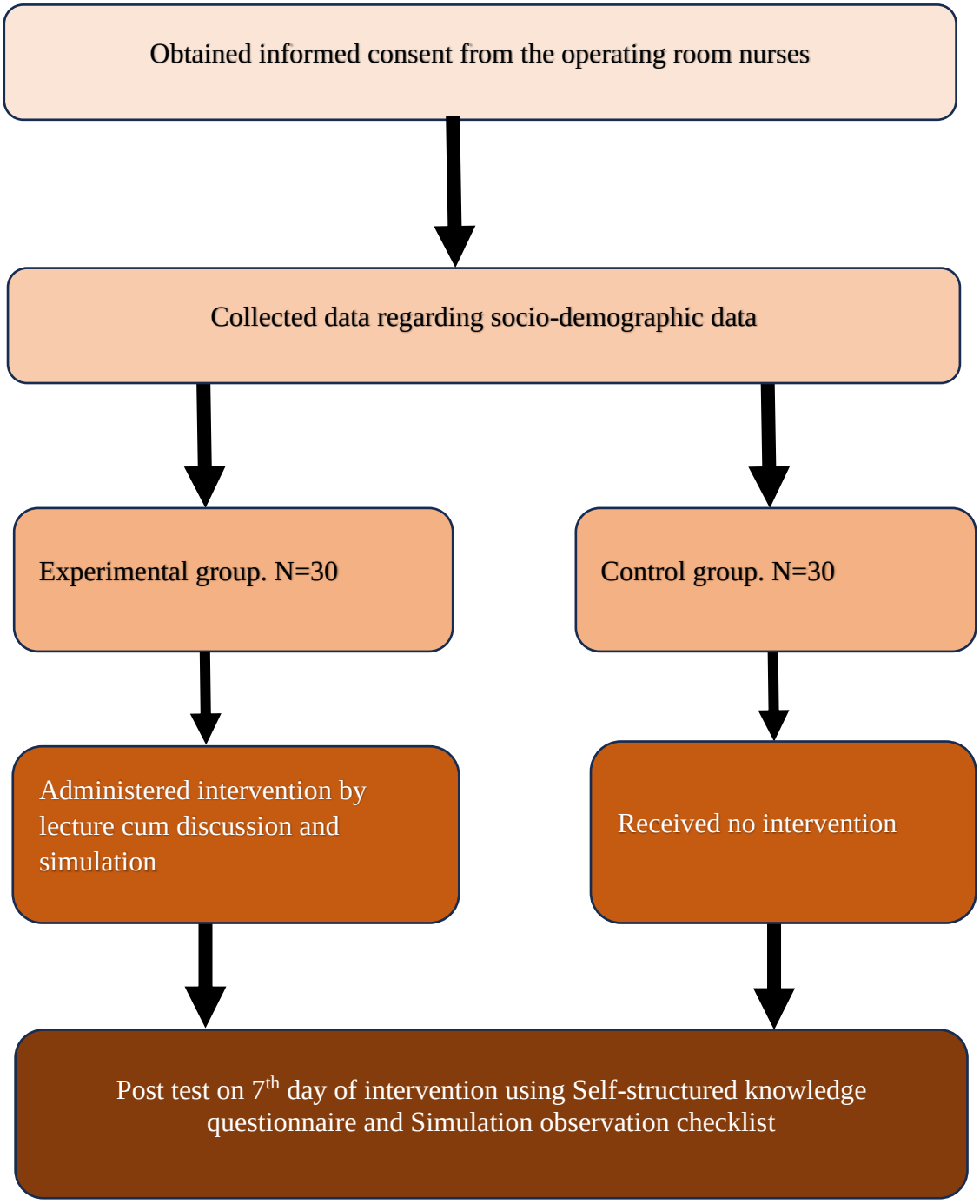
Obtained informed consent from the operating room nurses
Collected data regarding socio-demographic data
Experimental group. N=30
Control group. N=30
Administered intervention by lecture cum discussion and simulation
Received no intervention
Post test on 7th day of intervention using Self-structured knowledge questionnaire and Simulation observation checklist

Figure 3: Flow diagram of data collection procedure

Plan for data analysis

Data was analyzed using following descriptive and inferential statistics.

Table 1: Plan for data analysis

S.No.	Parameter	Statistical test
1	Description of socio demographic variables of operating room nurses in the experimental and control group	• Number • Frequency percentage distribution
2	**Objective 1:** To assess the effectiveness of demonstration regarding surgical safety on knowledge and skill among operating room nurses between experimental and control group.	• Mean and Standard deviation • Unpaired T test
3	**Objective 2:** To correlate the post test mean knowledge scores with skill scores among operating room nurses in experimental and control group.	• Pearson's Correlation
4	**Objective 3:** To associate the selected demographic variables with post test of knowledge and skill scores among operating room nurses in experimental and control group.	• Chi square (Fisher exact test)

Summary of the chapter

This chapter deals with the material and methods used for the current study. It includes research approach, research design, research variables, research setting, population, the sample, data collection tool, description of the intervention, ethical consideration, pilot study, procedure of data collection and the plan for data analysis.

CHAPTER 4

RESULT

CHAPTER 4

RESULT

Data analysis is a process for obtaining raw data and converting it into information useful for decision-making by users. Data is collected and analyzed to answer questions, test hypothesis or disprove theories.[25]

This chapter deals with analysis and interpretation of the data from 60 operating room nurses at AIIMS Bhopal.

The data was organized, tabulated and analyzed according to the objectives using SPSS version 18 software.

The findings based on the descriptive and inferential statistics analysis are presented under the following sections:

Section 1: Description of sociodemographic variables of operating room nurses in the experimental and control group.

Section 2: Effectiveness of demonstration regarding surgical safety on knowledge and skill among operating room nurses between experimental and control group.

Section 3: Correlation of the post test mean knowledge scores with skill scores among operating room nurses in experimental and control group.

Section 4: Association of the selected demographic variables with post test of knowledge and skill scores among operating room nurses in experimental and control group.

Section 1: Description of sociodemographic variables of operating room nurses in the experimental and control group.

Table 2: Frequency and percentage distribution and homogeneity testing of sociodemographic variables.

N=60

S.No.	Sociodemographic variable	Experimental group (N=30)		Control Group (N=30)		Chi square test	P value
		Frequency	%	Frequency	%		
1	**Age (years)**						
	21-25	5	17	3	10	1.2	0.59 (NS)
	26-30	14	47	18	60		
	31-35	11	37	9	30		
2	**Gender**						
	Male	17	57	14	47	0.60	0.43 (NS)
	Female	13	43	16	53		
3	**Educational Qualification**						
	GNM	7	23	5	17	0.55	0.75 (NS)
	B.Sc. Nursing	21	70	22	73		
	M.Sc. Nursing	2	6.6	3	10		
4	**Experience in OR**						
	<1yr	13	43	10	33	0.63	0.75 (NS)
	1-5 yrs	17	57	20	67		

5	**Attended education**					0.69	0.4 (NS)
	Yes	22	73	19	63		
	No	8	27	11	37		
6	**Follow checklist**						
	Yes	30	100	30	100	NA	NA
	No	0	0	0	0		

NS= Not Significant

Table 2 reveals that the majority of participants in both the experimental and control groups are in the age range of 26-30 years. The distribution of age groups is somewhat similar between the two groups, with a higher percentage of participants in the 26-30 years age range. There are more males in the experimental group (56.7%) compared to the control group (46.7%). The distribution of educational qualifications is relatively similar between the two groups, with the highest percentage in the BSc Nursing category. Participants with 1-5 years of experience dominate both the experimental and control groups. A higher percentage of participants in the experimental group (73.3%) attended education sessions compared to the control group (63.3%). All participants in both the experimental and control groups followed the checklist.

Section 2: Effectiveness of demonstration regarding surgical safety on knowledge and skill among operating room nurses between experimental and control group.

Section 2.1: Assessment of the post test level of knowledge and skill regarding surgical safety between experimental and control group among operating room nurses.

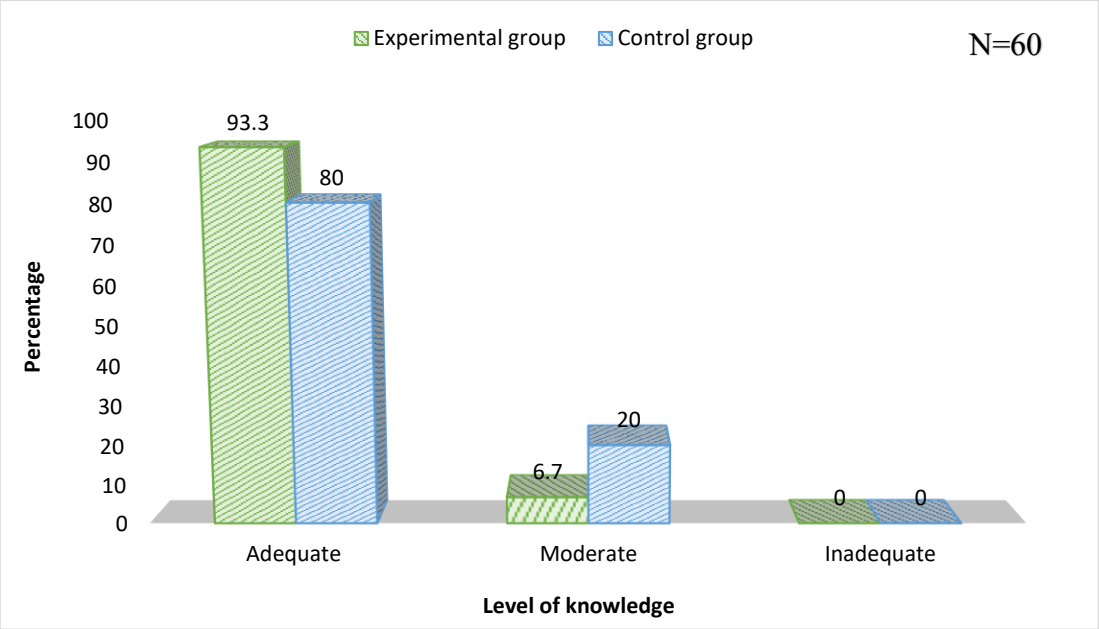

Figure 4: Percentage distribution of post test level of knowledge regarding surgical safety between experimental and control group among operating room nurses.

The chart shown as Figure 4 illustrates the percentage of post-test knowledge regarding surgical safety, which reveals a slight difference between the experimental and control groups. In the experimental group, 28 out of 30 operating room nurses (93.3%) acquired an adequate level of knowledge, while 2 out of 30 (6.7%) gained a moderate level of knowledge. On the other hand, in the control group, 24 out of 30 (80%) had adequate knowledge, and 6 out of 30 (20%) had moderate knowledge.

High statistical significance was drawn using chi square test at <0.05.

Hence, it is concluded that the experimental group gained better knowledge than the control group. This demonstrates the effectiveness of surgical safety demonstrations in improving the knowledge of operating room nurses in the experimental group.

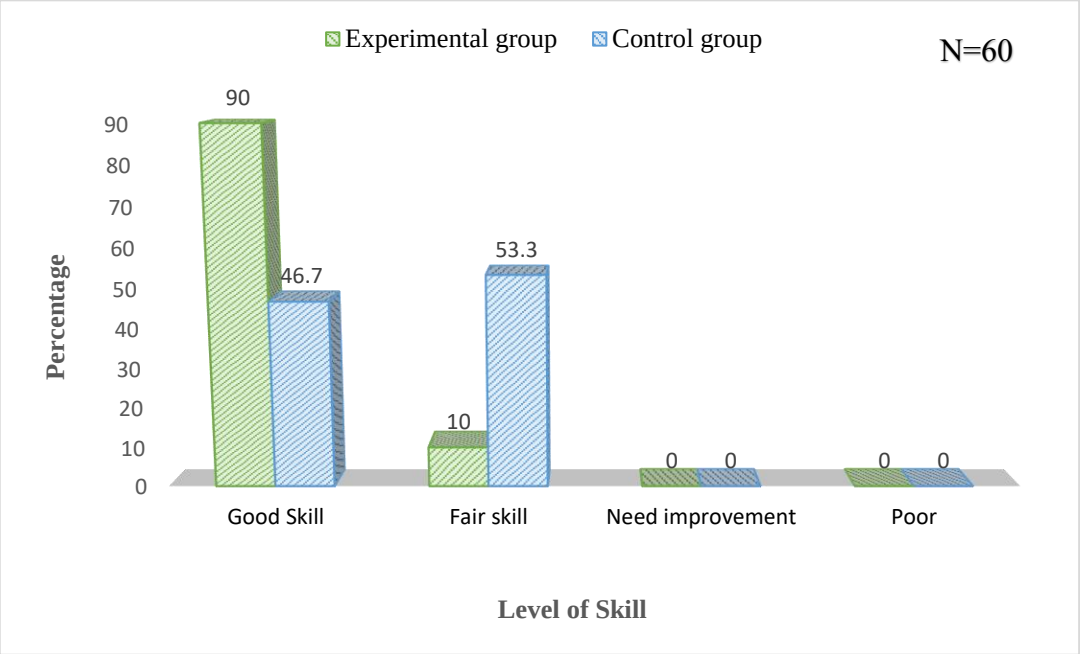

Figure 5: Percentage distribution of post test level of skill regarding surgical safety between experimental and control group among operating room nurses.

According to Figure 5, which shows the percentage distribution of post-test skill levels regarding surgical safety, the experimental group had 27 participants (90%) with good skill and only 3 participants (10%) with fair skill. On the other hand, in the control group, the majority of participants (16 or 53.3%) had fair skill, while 14 participants (46.7%) had good skill.

Very high statistical significance was calculated using chi square test at $p<0.001$.

It is evident that the operating room nurses in the experimental group performed the surgical safety checklist better than the control group, demonstrating the effectiveness of the demonstration on surgical safety checklist by the investigator.

Section 2.2: Comparison of post test level of knowledge and skill regarding surgical safety between experimental and control group among operating room nurses.

Table 3: Comparison of post test mean knowledge scores on surgical safety between experimental and control group. N=60

Group	N	Mean	Standard Deviation	Mean Difference	Unpaired T Test	P value
Experimental	30	18.53	1.25	1.4	3.529	0.001 (S)
Control	30	17.13	1.77			

Table value at 0.05 is 2.002, S = Significant

Table 3 shows the comparison of post test knowledge scores on surgical safety between experimental and control group.

The unpaired t-test results reveal a significant difference between the mean knowledge scores of the experimental and control groups (t-statistic = 3.529, p-value = 0.001). The critical table value at a 0.05 significance level (two-tailed) is 2.002. Since the calculated t-statistic (3.529) is greater than the table value, the difference in knowledge scores between the two groups is considered statistically significant.

The statistical analysis indicates that the experimental group, with a higher mean knowledge score (18.53) and mean percentage (92.67%), performed significantly better than the control group (mean score 17.13, mean percentage 85.67%). This suggests that the intervention applied to the experimental group has had a significant positive impact on knowledge acquisition compared to the control group.

Table 4: Comparison of post test mean skill scores on surgical safety between experimental and control group.

N=60

Group	N	Mean	Standard Deviation	Mean Difference	Unpaired T Test	P value
Experimental	30	23.3	1.51	3.23	5.69	<0.001 (S)
Control	30	20.07	2.71			

Table value at 0.05 is 2.002, S = Significant

Table 4 shows the comparison of post test skill scores on surgical safety between experimental and control group.

The unpaired t-test results reveal a significant difference between the mean knowledge scores of the experimental and control groups (t-statistic = 5.693, p-value = 0.001). The critical table value at a 0.05 significance level (two-tailed) is 2.002. Since the calculated t-statistic (5.69) is greater than the table value, the difference in knowledge scores between the two groups is considered statistically significant.

The statistical analysis indicates that the experimental group, with a higher mean skill score (23.3) and mean percentage (93.2%), performed significantly better than the control group (mean score 20.07, mean percentage 80.28%). This suggests that the intervention applied to the experimental group has had a significant positive impact on skill acquisition compared to the control group.

Section 3: Correlation of the post test mean knowledge scores with skill score among operating room nurses in experimental and control group.

Table 5: Correlation between post test mean knowledge scores with skill scores in the experimental and control group.

N=60

Group	Variables	Post test		Pearson's Correlation	Type of correlation
		Mean	SD		
Experimental	Knowledge	18.5	1.3	r = 0.532 p=0.02** S	Positive
	Skill	23.3	1.5		
Control	Knowledge	17.1	1.8	r =0.756 p<0.01** S	Positive
	Skill	20	2.7		

Table value at 0.05 is 0.361, S= Significant

Table 5 depicts the correlation between mean knowledge score with skill scores among experimental and control group, analysed using Pearson's Correlation coefficient. This indicates that there was a significant positive correlation between post test knowledge scores and skill scores, which infers that as knowledge increases their skill also increases.

Similarly, in control group a significant positive correlation was identified between post test knowledge and skill scores, which infers that as knowledge increases their skill also increases.

The calculated "r" value among experimental and control group, r=0.532 and 0.756 respectively thus revealed a high statistical significance and a positive moderate correlation between knowledge and skill at $p<0.05$ level.

Hence improving knowledge regarding surgical safety has also enhanced the skill in experimental and control group.

Section 4: Association of the selected demographic variables with post test of knowledge and skill scores among operating room nurses in experimental and control group.

Table 6: Association of selected demographic variables with post test knowledge scores among operating room nurses in the experimental group.

N=30

Sociodemographic variables		Knowledge			Chi square test	dF	Table Value	p value
		Adequate	Moderate	Inadequate				
Age	21-25 yrs	5	0	0				
	26-30 yrs	13	1	0	0.71*	2	5.99	0.7 (NS)
	31-35 yrs	10	1	0				
	>35 yrs	0	0	0				
Gender	Male	15	2	0	1.63	1	3.84	0.2 (NS)
	Female	13	0	0				
Education	GNM	6	1	0				
	Bsc Nursing	20	1	0	1.76*	2	5.99	0.4 (NS)
	Msc Nursing	2	0	0				
Experience	<1 yr	11	2	0				
	1-5 yrs	17	0	0	2.8	1	3.84	0.09 (NS)
	>5 yrs	0	0	0				
Attended In-service education	Yes	21	1	0	0.59	1	3.84	0.44 (NS)
	No	7	1	0				
Follow Checklist	Yes	28	2	0	It is a constant			
	No	0	0	0				

*= **Fishers exact test, NS = Not Significant**

Table 6 depicts the association of selected demographic variables with post test knowledge score among operating room nurses in the experimental group using fisher's exact test. This indicates that there is no significant association between knowledge score of the experimental group and demographic variables at $p<0.05$ level of significance.

Table 7: Association of selected demographic variables with post test skill scores among operating room nurses in the experimental group.

N=30

Sociodemographic variables		Skill				Chi square test	dF	Table Value	p value
		Good	Fair	Need improvement	Poor				
Age	21-25 yrs	5	0	0	0				
	26-30 yrs	12	2	0	0	0.69*	2	5.99	0.7
	31-35 yrs	10	1	0	0				(NS)
	>35 yrs	0	0	0	0				
Gender	Male	16	1	0	0	0.73	1	3.84	0.39
	Female	11	2	0	0				(NS)
Education	GNM	7	0	0	0				
	Bsc Nursing	19	2	0	0	3.39*	2	5.99	0.18 (NS)
	Msc Nursing	1	1	0	0				
Experience	<1 yr	12	1	0	0				
	1-5 yrs	15	2	0	0	0.13	1	3.84	0.71 (NS)
	>5 yrs	0	0	0	0				

Attended In-service education	Yes	21	1	0	0	2.7	1	3.84	0.09 (NS)
	No	6	2	0	0				
Follow Checklist	Yes	27	3	0	0	It is a constant			
	No	0	0	0	0				

***= Fishers exact test, NS = Not Significant**

Table 7 depicts the association of selected demographic variables with post test skill scores among operating room nurses in the experimental group using fisher's exact test. This indicates that there is no significant association between skill scores of the experimental group and demographic variables at $p<0.05$ level of significance.

Considering control group also none of the demographic variables showed statistical significant association with post test mean knowledge and skill score.

Summary of the chapter

The chapter dealt with the presentation of analysis and interpretation of the data collected from the study. The analysis of data was presented in four parts. The mean knowledge scores for the experimental group and control group was 18.53 ±1.25 and 17.13 ±1.77 respectively. The mean skill scores for the experimental group and control group was 23.3 ±1.51 and 20±2.71 respectively. The intervention effectively improved knowledge and skills in the experimental group.

CHAPTER 5

DISCUSSION

CHAPTER 5

DISCUSSION

The primary conclusions of the study are covered in this chapter. The limitations, consequences, conclusions, and recommendations are examined in relation to the existing literature.

Major findings of the study.

1. The mean knowledge score for the experimental group and control group was 18.53 ±1.25 and 17 ±1.87 respectively. The mean skill score for the experimental group and control group was 23.3 ±1.51 and 20±2.71 respectively. The intervention effectively improved knowledge and skills in the experimental group.
2. The calculated "r" value among experimental and control group, r=0.532 and 0.756 respectively thus revealed a high statistical significance and a positive moderate correlation between knowledge and skill at $p<0.05$ level.
3. In both experimental and control group none of the demographic variables showed statistical significant association with post test mean knowledge and skill score.

Discussion

1. Description of socio demographic variables of the participants

In the present study the majority of participants in both the experimental and control groups are in the age range of 26-30 years. The distribution of age groups is somewhat similar between the two groups, with a higher percentage of participants in the 26-30 years age range. The distribution of educational qualifications is relatively similar between the two groups, with the highest percentage in the BSc Nursing category. In a similar study conducted by SK Sharma it can be seen that most (56%) of the participants were in the age group of 20-25 years and majority (88%) of the participants had baccalaureate nursing degree as a qualification.[30] Another study conducted by Gong J found similar finding that majority (86.4%) of operating room nurses had Bachelor's degree.[36]

In the present study there are more males in the experimental group (56.7%) compared to the control group (46.7%). Similarly in another study by Daryani D. It was discovered that 44 respondents, or 77.2% of the total, were men.[50] On the contrary, study conducted by Kisacik OG. where 89.2% of the nurses were female.[31]

In the current study, it was found that participants with 1-5 years of experience dominate both the experimental and control groups. Edin Alisic et al. in their study have shown that majority of the participants 67 (33%) had ≥20 years of experience.[17] The discrepancy may result from the studies assessment of distinct populations, whereas the current study exclusively includes operating room nurses.

In the present study a higher percentage of participants in the experimental group (73.3%) attended education sessions compared to the control group (63.3%). Similar study by

Kisacik OG found that all participants knew the SSC and used it in their OR, while 80.4% had learned the SSC in hospital in-service training. [31]

All participants in both the experimental and control groups followed the checklist. Ajitha and Pravalika in her study have shown that 5.17% never use, 25.86% occasionally, 34.48% most of the time and 34.48% use the safety checklist all the time in the operating room.[41]

Description of assessment of level of knowledge and skill regarding surgical safety checklist.

In current study in the experimental group, 28 out of 30 operating room nurses (93.3%) acquired an adequate level of knowledge, while 2 out of 30 (6.7%) gained a moderate level of knowledge. On the other hand, in the control group, 24 out of 30 (80%) had adequate knowledge, and 6 out of 30 (20%) had moderate knowledge. In a similar study conducted by Ilorah in South Africa, 97% recognized what SSC was, 84% knew where it was, 86% thought it was easily accessible, 96% knew why it was used, and 90% knew when to use it.[51] and this pattern can be seen in another study by Sharma P et al. wherein the largest number of volunteers—52 (54.17%)—had strong knowledge regarding SSC, 35 (36.83%) had average knowledge, and 9 (9.3%) had low knowledge. The personnel's knowledge was evaluated using a 6-point scale.[40] On the contrary Emily JD et al. found a significant difference between the OR nurses in the study group and the control group. While the majority of nurses in the control group, 22 (76.7%), had inadequate knowledge, 19 (63.3%) and 11 (36.7%) of the OR nurses in the study group had adequate and moderate levels of knowledge.[49]

This difference in knowledge of control and experimental group could be associated with the intervention program given to the experimental group contributing to increase in their knowledge.

In the present study the experimental group had 27 participants (90%) with good skill and only 3 participants (10%) with fair skill. On the other hand, in the control group, the majority of participants (16 or 53.3%) had fair skill, while 14 participants (46.7%) had good skill. Similarly Emily D. et al. in her study have shown that, in the study group most of the participants, 22 (73.3%) had good skill and only few had fair skill. Of the individuals in the control group, 6 (24%) had fair skill, 24 (80%) percent needed to improvement in their skill, and none had good skill.[49] Motta Filho G da R et al. found that, of the 502 orthopedists, 40.8% reported having operated on the incorrect patient or at the incorrect place, and 25.6% cited "miscommunication" as the primary reason for the error. 65.3% of respondents said they were either completely or somewhat unaware of the World Health Organization's (WHO) Surgical Safety Checklist, and 35.5% said they did not label the surgical site before transferring the patient to the operating room. Of the orthopedists, 72.1% had never received training on how to apply this technique.[52]

The reason for this finding may be due to lack of proper training on performing SSC despite having good knowledge the health professionals find it difficult to apply it in the actual scenario.

Correlation between post test mean knowledge score with skill score

In current study the correlation between mean knowledge score with skill score among experimental and control group was analysed using Pearson's Correlation coefficient. It indicated that there was a significant positive correlation between post test knowledge score and skill score, which infers that as knowledge increases their skill also increases. Also in control group a significant positive correlation was identified between post test knowledge and skill score. The calculated "r" value among experimental and control group, r=0.53 and 0.75 respectively thus revealed a high statistical significance and a

positive moderate correlation between knowledge and skill at $p<0.05$ level. In a similar study, Daryani D obtained the chi square test with a p value of 0.002 meaning $p <0.05$ stating that there is a significant relationship between knowledge and the application of SSC. This is so that staff knowledge and compliance can be increased through training, which is essential for the successful implementation of the surgical safety checklist.[50]

Sendlhofer G et al. found that there is no significant correlation between subjective and objective knowledge for either consultants (rho = -0.134, p = 0.307) or nursing staff (rho = -0.178, p = 0.077) as well as within the total cohort (rho = -0.131, p = 0.098)[44]

Association between sociodemographic variables and knowledge and skill score among operating room nurses.

In the present study it is observed that there is no significant association between knowledge score of the experimental group and demographic variables at $p<0.05$ level of significance. Similarly, at the $p<0.05$ level of significance, there is no significant correlation between the experimental group's skill score and demographic characteristics. According to Sharma SK et al., attitudes about surgical safety were unaffected by a nurse's age, gender, training institution, credentials, length of clinical experience, or perioperative care. Nonetheless, a substantial correlation was discovered between the perioperative nurses awareness and the type of training institution (p=0.00*); also, the length of clinical experience was shown to be significantly correlated with the perioperative nurses awareness (p=0.01).[30]

Limitations

1. The researcher faced difficulties in collecting samples due to the busy schedules and workload of the operating room nurses. To address this issue, the researcher organized classes on Saturdays with the help of the SNOs of the respective OTs.
2. As the samples were professionals, conducting a pretest could have created pretest bias among the study and control group. Therefore, the researcher opted for a post-test only control group design

Implications

The researcher has drawn the following implications which can be applicable in different levels of nursing profession.

Nursing practice

1. Avoids any potential harm in the operation room.
2. Enhances the standard of care provided to patients in the operating room.
3. Improves the efficiency of the surgical team.
4. Promotes communication amongst members of the surgical team.
5. Standardized monitoring of every facet of the operation is beneficial.
6. Creates a safety culture in the operating room that is patient-centered.
7. It gives other team members a chance to express their opinions about surgical intervention.
8. In the end, follows the "Do not harm" code of ethics.
9. It fosters a culture of trust among employees, giving them the confidence to report patient safety incidents without worrying about repercussions.
10. It creates a framework for team leadership development and gives everyone the authority they need to act in the patients' best interests.

Nursing education

- The nursing curriculum needs to be updated to reflect developments in the healthcare industry, particularly with regard to operating room procedures.
- Nursing students can attend seminars, workshops, and conferences to expand their knowledge and proficiency in operating room procedures.
- To increase their degree of operating room competency, they might enroll in specialized courses.

Nursing administration

- To conduct the surgical safety checklist, nurse supervisors can teach operating room nurses leadership and communication techniques.
- Nurse managers keep an eye on the operating room staff to make sure they follow protocol when carrying out safety procedures.
- Positive patient care outcome measures are assessable by nurse management.

Nursing research

- The results of the research can be published in journals and on websites, as well as presented at conferences and seminars.
- A qualitative research study can be carried out by nurse researchers to evaluate the efficacy of surgical safety checklists.
- Nurse researchers should fervently urge all operating room nurses to uphold the highest standards of care by completing the surgical safety checklist.
- Nurse researchers have the ability to inspire nursing students to conduct additional patient safety research.

Recommendations

1. The intervention developed by the researcher can be utilized by the Operating room nurses in the hospital for the induction training program.
2. The researcher recommends conducting the assessment of skill in the actual operation scenario so that response bias can be reduced.
3. The researcher advises future nurse researchers to investigate the same subject using a time series methodology and assess the results.

Conclusion

The present study assessed the effectiveness of demonstration on knowledge and skill on patient safety among operating room nurses. The study findings revealed that, while comparing the post test level of knowledge and skill showed a significant improvement in experimental group after administration of demonstration which has been devised by the investigator. Hence it was an effective tool to update knowledge and improve the skill of operating room nurses.

Summary of the chapter

Major findings, a discussion of the reviewed literature in connection to the study's implications, and suggestions for further research are all included in this chapter.

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ANNEXURES

Annexure No: 1

LETTER SEEKING PERMISSION TO CONDUCT STUDY

DEAN (Nursing/Paramedics) Office
AIIMS, BHOPAL (M.P.) 462020
Dispatch No. 436
Date: 12/9/23

From,
Sandhya Kumari Sinha
M.Sc. Nursing Student (2022-2024 batch)
Nursing College
AIIMS Bhopal

Date: 11/9/23

NURSING COLLEGE, OFFICE
AIIMS, BHOPAL (M.P.)-462020
Received No. 11350
Date: 12/9/23
19/9/23

To,
The Medical Suprintendent
AIIMS Bhopal

NURSING COLLEGE, OFFICE
AIIMS, BHOPAL (M.P.)-462020
Dispatch No. 10754
Date: 12/9/23

(Through proper channel)

Subject- Letter seeking permission for conducting Research study at AIIMS Bhopal.

DEAN (Nursing/Paramedics) Office
AIIMS, BHOPAL (M.P.) 462020
Received No. 500
Date: 12/9/23
16/9/23

Respected Sir/Madam,

As a part of the curriculum, myself Sandhya Kumari Sinha M.Sc. student, AIIMS Bhopal conducting a research study titled ***"Effectiveness of demonstration on the knowledge and skill regarding surgical safety among operating room nurses working at AIIMS Bhopal."***

I hereby seek your permission to conduct data collection of the above-mentioned research study.

- **~~IHEC-SR Reference No~~**: AIIMS/BPL/IHECSR/July/22/MscN/05
- **Duration of data collection**: September to January
- **Area of data collection**: Second floor Modular OT and Third floor Modular OT complex and Trauma OT complex (Assistant Nursing Superintendent room)

The proposed study is approved by the IHEC-SR, AIIMS Bhopal and the letter of permission is enclosed herewith for your reference. Kindly grant permission for the same.

Submitted for your kind perusal.

Thanking you.
Sandhya Kumari Sinha
(Student Investigator) (+918851698581)
sandhyakumari.mscnursing22@aiimsbhopal.edu.in

Receipt: 4103
MSO/AIIMS/BPL
Dated: 13/9/23

Dispatch: 4103
MSO/AIIMS/BPL
Dated: 13/9/23

GUIDE:
Mr. R. Velmurugan
Assistant Professor
Nursing College
AIIMS Bhopal

CO-GUIDE:
Mr. Kumarasamy A.P
Assistant Professor
Nursing College
AIIMS Bhopal

I/C Principal
Dr. Mamta Verma
Associate Professor
Nursing College
AIIMS Bhopal

Enclosure-
1. Research Proposal
2. LOP From IHEC-SR, AIIMS Bhopal

Copy to-
1. OT In-charge
2. Assistant Nursing Superintendent (Second floor Modular OT, Third floor Modular OT and Trauma OT)

Forwarded through Associate Dean (HP)/

Forwarded 12.09.23 Dean (A&P)

Forwarded 12/9/23.

Dean (N&P)

Annexure No:2

SCREENING TOOL

Screening tool for data collection

Code No.

Age:

Gender:

Currently working in Operation theatre (floor):

Contact number:

• Are you working as operating room nursing officer in AIIMS Bhopal	Yes/ No
• Whether the client is willing to participate or giving informed consent?	Yes/ No
• Whether the client understand English?	Yes/ No

Annexure No:3

TOOL FOR DATA COLLECTION

Tool for Data Collection

Section 1: Socio-demographic data

Instructions: Kindly tick (✓) the appropriate data to all questions asked below.

1. Age (in years) _____
2. Gender
   - □ Male
   - □ Female
   - □ Other
3. Educational qualification
   - □ GNM
   - □ B.Sc. Nursing
   - □ M.Sc. Nursing

   Others (specify)_____
4. Experience in Operating Room (in years) _____
5. Attended in-service education on Surgical Safety Checklist given by WHO within or before 6 months of duration
   - □ Yes
   - □ No
6. Do you follow WHO's surgical safety checklist in Operation theatre?
   - □ Yes
   - □ No

Section 2: Self-structured Knowledge questionnaire

Instruction: Specify the most suitable answers for the each of the following questions from the options given below:

1. What is a Surgical Safety Checklist (SSC)?
    - **a.** A list of equipment that will be required during the surgery
    - **b.** A tool to ensure that all staff in the practice are prepared for an emergency situation
    - **c. A tool to reduce the risk of preventable complications**
    - **d.** A document listing all the roles of staff members in the operating theatre
2. Surgical safety checklist formulated by
    - **a.** Surgical Safety Association
    - **b.** American Heart Association
    - **c.** Surgical Nurses Association
    - **d. World Health organization**
3. In human centred operating theatres, data tells us that the use of SSC has:
    - **a.** Made operating times and waiting lists shorter
    - **b. Improved communication and reduced preventable incidents**
    - **c.** Helped staff members get to know each other better
    - **d.** Reduced waste in the operating theatre
4. Surgical safety checklist is initiated to
    - **a.** Reduce the number of surgical team members
    - **b. Reduce the number of surgical deaths**
    - **c.** Reduce the number of surgical equipment
    - **d.** Reduce the number of surgical medications

5. The three parts of a SSC are:
    a. Sign on, Time on and Sign Out
    b. Sign in, Time in and Time out
    c. Sign in, Time out and Sign out
    d. Log in, Time out and Sign out
6. During which part of the SSC do the team confirm the patient identification?
    a. Time in
    b. Sign in
    c. Sign out
    d. Log in
7. During which part of the SSC do the anaesthesia team discuss any known allergy to the patient?
    a. Time out
    b. **Sign in**
    c. Sign Out
    d. Log in
8. At which part of the SSC do the team discuss their concerns and any potential critical events?
    a. Time out
    b. Sign in
    c. Sign out
    d. Log in
9. Sign In phase begins during the
    a. Period after induction of anaesthesia
    b. Period after skin incision

c. Period before induction of anaesthesia

d. Period before skin incision

10. Risk of blood loss is verified under

a. Time Out and Wheel Out

b. Sign In and Time Out

c. Sign Out and Sign In

d. Check In and Check Out

11. Antibiotic prophylaxis should be given within

a. 60 minutes

b. 30 minutes

c. 20 minutes

d. 10 minutes

12. Why is it useful to discuss potentially critical events before surgery starts?

a. It allows staff to inform the family members about their concerns

b. It allows staff to prepare be more alert to the possibility of such events

c. It allows staff to prepare the rotation and ask extra staff to stay late

d. It allows staff to plan how the theatre will be cleaned after the operation

13. Right time to perform time out procedure

a. before patient entering into OT

b. before skin incision/ invasive procedure

c. after patient leaves the OT

d. after skin closure

14. Documentation of timeout procedure is done through

a. checklist

b. rating scale

c. video recording

d. writing report

15. Time out procedure is performed by

a. scrub nurse

b. surgeon

c. anaesthetist

d. circulatory nurse

16. Time out procedure is performed only for

a. paediatric patient

b. high risk patient

c. patient who undergoes surgery

d. contact isolated patient

17. Which of the following is an example of a potentially critical event that might be discussed during the SSC?

a. The diet that the patient will need after the surgery

b. **Acute blood loss and the planned action required if it occurs**

c. The health of the operating surgeon

d. The use of suture material during the surgery

18. Sign out phase begins

a. before removing the patient from operating room

b. after removing the patient from operating room

c. before skin closure

d. after extubating

19. Sign out phase involves the following aspects **except:-**

a. labelling the specimen

b. recording the name of the procedure

c. availability of pulse oximeter

d. instrument, sponge, needle counts are correct

20. Conditions in which site marking is **not** essential:

a. Laparoscopic surgery

b. Routine surgery

c. Emergency surgery

d. General surgery

Section 3: Simulation Observation Checklist

Instruction: The participant will perform as a circulatory nurse in the return demonstration. The researcher will tick (✓) in the suitable places based on the observations during return demonstration by nursing officers.

S.No.	Components	YES	NO
Section A: Before induction of anaesthesia (Sign in)			
1.	Patient confirms his/her identity.		
2.	Patient confirms the site of surgery.		
3.	Patient confirms the procedure.		
4.	Patient confirms the consent.		
5.	Confirms if surgical site is marked.		
6.	Confirms if anaesthesia machine and medication check complete.		
7.	Confirms if pulse oximeter on the patient and functioning		
8.	Confirms if any known allergy present.		
9.	Confirms difficult airway or aspiration risk		
10.	Confirms the risk of blood loss.		
Section B: Before skin incision (Time out)			
11.	Confirms all team members have introduced themselves by Name and Role		

12.	Verbally confirms patient name, procedure and site with surgeon.		
13.	Confirms if antibiotic prophylaxis is given within last 60 minutes.		
14.	Asks for any critical step that the team should know.		
15.	Asks for the expected time of surgery.		
16.	Asks the expected blood loss.		
17.	Asks for any patient specific concern.		
18.	Asks if sterility of the instruments been confirmed.		
19.	Asks for any equipment issues or concerns.		
20.	Confirms if essential imaging is displayed.		
Section C: Before patient leaves operating room (Sign out)			
21.	Verbally confirms the name of the procedure.		
22.	Asks if instrument, swab and sharp counts are complete.		
23.	Confirms the specimen labelling		
24.	Confirms any equipment problem that need to be addressed.		
25.	Asks for the key concerns for recovery and management of the patient.		

Annexure No: 4

INTERVENTION TOOL

Section 4: Lesson plan for Lecture cum discussion on Surgical Safety Checklist

Topic: Surgical safety checklist

Group: Operating room nurses

Place: Operating room

Duration: 20 min

Type of teaching: Group

Teaching method: Lecture cum discussion

Instructor: Investigator

Instrumental Aid: Power point presentation

General Objective: At the end of the intervention the Operating room nurses develops in depth knowledge regarding Surgical Safety Checklist

Specific objectives: At the end of the intervention the Operating room nurses will be able to:

1. Introduces the topic
2. Define surgical safety checklist.
3. Enumerate the 10 objectives of safe surgery given by WHO.
4. Describe the 3 phases of operation.
5. Explain SIGN IN phase.
6. Explain TIME OUT phase.
7. Explain SIGN OUT phase.
8. Enlist the advantages of using a checklist while performing a surgery.

Time	Specific objectives	Content	Investigator and learner activity	AV AIDS	Evaluation
2 min	Introduces the topic	**Introduction** In 2008 the World Health Organization (WHO) introduced a surgical safety checklist applicable to all surgical teams to be used for every patient undergoing a surgical procedure. This tool has been implemented around the world, and encourages dialogue within multidisciplinary teams and the use of routine safety checks to minimize harm to our patients.	Lecture cum Discussion	PowerPoint presentation, green board	Surgical safety checklist was introduced by?
1 min	Define Surgical Safety Checklist	**Surgical Safety Checklist: (World Health Organization)** • The Safe Surgery Saves Lives initiation was established by the World alliance for patient safety as part of the World Health	Lecture cum Discussion	PowerPoint presentation, green board	The aim of the resulting WHO Surgical Checklist First Edition?

		Organization's efforts to reduce the number of surgical deaths across the world. • The aim of this initiative is to harness political commitment and clinical will to address important safety issues, including inadequate anesthetic safety practices, avoidable surgical infection and poor communication among team members. • These have proved to be common, deadly and preventable problems in all countries and settings. • To assist operating teams in reducing the number of these events, the Alliance- in consultation with surgeons, anesthesiologists, nurses, patient safety experts and patients around the world has			

		identified a set of safety checks that could be performed in any operating room. • The aim of the resulting WHO Surgical Checklist First Edition is to reinforce accepted safety practices and foster better communication and teamwork between clinical disciplines. • The checklist is not a regulatory device or a component of official policy; it is intended as a tool for use by clinicians interested in improving the safety of their operations and reducing unnecessary surgical deaths and complications.			

2 min	Enumerate the 10 objectives of safe surgery given by WHO.	**WHO's 10 objectives for Safe Surgery:** 1. The team will operate on the correct patient at the correct site. 2. The team will use methods known to prevent harm from administration of anaesthetics, while protecting the patient from pain. 3. The team will recognize and effectively prepare for life-threatening loss of airway or respiratory function. 4. The team will recognize and effectively prepare for risk of high blood loss. 5. The team will avoid inducing an allergic or adverse drug reaction for which the patient is known to be at significant risk.	Lecture cum Discussion	PowerPoint presentation, green board	State any 2 objective for safe surgery.

		6. The team will consistently use methods known to minimize the risk for surgical site infection. 7. The team will prevent inadvertent retention of instruments and sponges in surgical wounds. 8. The team will secure and accurately identify all surgical specimens. 9. The team will effectively communicate and exchange critical information for the safe conduct of the operation. 10. Hospitals and public health systems will establish routine surveillance of surgical capacity, volume and results.			

2 min	Describe the 3 phases of operation.	**The checklist divides the operation into three phases**: • Each corresponding to a specific time period in the normal flow of a procedure- the time period before induction of anesthesia **(Sign in)**, the period after induction and before surgical incision **(Time out)**, and the period during or immediately after wound closure but before removing the patient from the operating room **(Sign out)**. • In each phase, the checklist coordinator must be permitted to confirm that the team has completed its task before it proceeds further. • As operating teams become familiar with these steps of the checklist they can	Lecture cum Discussion	PowerPoint presentation, green board	The checklist is divided into how many phases?

		integrate these checks into their familiar work patterns and verbalize their completion of each step without the explicit intervention of the checklist coordinator. • Each team should seek to incorporate use of the checklist into its work with maximum efficiency and minimum disruption while aiming to accomplish these steps effectively.			
4 min	Explain SIGN IN phase	**Sign in phase:** - "The sign in is to be completed before induction of anesthesia in order to confirm the safety of proceedings". - The "Sign in" requires the presence of the anesthetist and nursing personnel at the very least.	Lecture cum Discussion	PowerPoint presentation, green board	Sign In phase should be completed before induction of anesthesia or not?

		The checklist coordinator may complete this section all at once or sequentially, depending on the flow of preparation for anesthesia. The detail for each of the boxes in the “Sign in” are as follows: 1. ***The patient has confirmed identity, site, procedure and consent.*** 2. ***Site marked/not applicable.*** 3. ***Anesthesia safety checklist completed.*** 4. ***Pulse oximeter on patient and functioning.*** 5. ***Does the patient have a known allergy?*** 6. ***Does the patient have a difficult airway/ aspiration risk?*** 7. ***Does the patient have a risk of >500ml blood loss (7ml/kg in children)?***			

		(Note that the expected blood loss will be reviewed again by the surgeon during the “time out”. This will provide a second safety check for the anesthesia professional and nursing staff) ***At this point the sign in is completed and the team may proceed with anesthetic induction.***			
4 min	Explain TIME OUT phase.	**The Time Out phase:** “The Time Out is a momentary pause taken by the team just before skin incision in order to confirm that several essential safety checks are undertaken and involves everyone on the team”. – Time OUT team: • Surgeons • Anesthesia professional • Nurses • Operating room technicians	Lecture cum Discussion	PowerPoint presentation, green board	Time Out team consist consists of?

		1. ***Confirm all team members have introduced themselves by Name and Role*** 2. ***Surgeon, Anesthesia professional and nurse verbally confirm patient site and procedure.*** 3. ***Anticipated critical events.*** 4. ***Surgeon reviews:*** • ***What are the critical or unexpected steps,*** • ***Operative duration, anticipated blood loss?*** 5. ***Anesthesia team reviews:*** • ***Are there any patients-specific Concerns?*** 6. ***Nursing team reviews:***			

		• ***Has sterility (including indicator results) being confirmed? Are their equipment issues or Any concerns?*** 7. ***Has antibiotic profile access been given within the last 60 minutes?*** 8. ***Is essentially managing displayed?*** ***At this point the time out is completed and the team may Proceed with the operation***			
3 min	Explain SIGN OUT phase	**The Sign out phase:** "The Sign out should be completed before removing the patient from the operating room. The aim is to facilitate the transfer of important information to the team responsible for the care of the patient after surgery". – The "sign out" can be initiated by the circulating nurse, surgeon or anesthesia	Lecture cum Discussion	PowerPoint presentation, green board	The Sign Out phase begins after?

		professional and should be accomplished before the surgeon has left the room. It can coincide, for example, with the wound closure. – Again, each box should be checked only after the coordinator has confirmed that each item has been addressed by the team. ***1. Nurse verbally confirms with the team:*** • ***The name of the procedure recorded*** ***2. Instrument, sponge and needle counts are correct (or not applicable)*** ***3. How the specimen is labelled (including patient name)*** ***4. Are there any equipment problems to be addressed?***			

		5. ***Surgeon, anesthesia professional and nurse review the key concern for recovery and management of the patient. With the final step, the safety checklist is completed. If desired, the checklist can be placed in the patient record Or retained for quality assurance review.***			
2 min	Enlist the advantages of using a checklist while performing a surgery.	**Advantages of using a Checklist** ▪ Customizable to local setting and needs ▪ Supported by evidence ▪ Evaluated in diverse settings around the world ▪ Promotes adherence to established safety practices ▪ Minimal resources required to implement a far-reaching safety intervention	Lecture cum Discussion	PowerPoint presentation, green board	What are the advantages of using a checklist?

Section 4: Script of Simulation performing Surgical Safety Checklist

The simulation team except the circulatory nurse has been trained by the investigator prior.

Introduction: Good morning, everyone. I'm Sandhya kumari sinha, student of M.Sc. nursing first year. I will be showing the simulation regarding the use of Surgical Safety Checklist along with my colleagues. The simulation team consist of:

- Myself Sandhya as circulatory nurse role and checklist coordinator
- Sonika as patient role
- Angita as surgeon role
- Dipali as anaesthetist role
- Dharamdas as scrub nurse role

The activity will be divided into three sections SIGN IN (before induction of anaesthesia), TIME OUT (before skin incision) and SIGN OUT (before patient leaves operating room) **Scenario:**

- Patient name: Sonika
- Age: 23
- Diagnosis: Appendicitis
- Site: Right lower quadrant of abdomen
- Procedure: Laparoscopic Appendectomy

SIGN IN

	Circulatory nurse	:	Good day everyone. I'm nurse Sandhya the Circulatory nurse. Is everyone ready for SIGN IN?
	Circulatory nurse	:	Good morning ma'am. How are you?
	Patient	:	Good morning
1.	Circulatory nurse	:	What's your name?
	Patient	:	My name is Sonika
2.	Circulatory nurse	:	On which side the surgery will be performed?
	Patient	:	On right side
3.	Circulatory nurse	:	For what surgery are you here?
	Patient	:	Laparoscopic appendectomy.
4.	Circulatory nurse	:	Consent being confirmed?
	Patient	:	Yes
5.	Circulatory nurse	:	Has surgical site been marked?
	Circulatory nurse	:	Confirms
6.	Circulatory nurse	:	Anaesthesia machine and drug, are they checked?

	Anaesthetist	:	The machine is being checked, drugs are drawn up and everything is ready to go.
7.	Circulatory nurse	:	Is the pulse oximeter on the patient and functioning?
	Anaesthetist	:	Yes, the pulse oximeter is on the patient and functioning.
8.	Circulatory nurse	:	Any known allergy for this patient?
	Anaesthetist	:	No allergies
9.	Circulatory nurse	:	Is there any difficult airway or aspiration risk?
	Anaesthetist	:	No difficult airway and no increased risk of aspiration.
10.	Circulatory nurse	:	Any risk of blood loss more than 500ml?
	Anaesthetist	:	Minimal risk of blood loss, two IV access and fluids are available.

TIME OUT

	Surgeon	:	Is everyone ready for TIME OUT procedure? Nurse Sandhya, go ahead please.
11.	Circulatory nurse	:	Can you all introduce yourself along with your role?
	Surgeon	:	I'm Dr. Aityhang. I'm the surgeon.
	Anaesthetist	:	I'm Dr. Dipali, the anaesthetist
	Scrub nurse	:	I'm nurse Dharamdas, the scrub nurse.

12.	Circulatory nurse	:	Before we make the skin incision, does everyone agree that this patient Ms. Sonika is undergoing a right sided Laparoscopic Appendectomy.
	Surgeon	:	Yes
	Anaesthetist	:	Yes
	Scrub nurse	:	Yes
13.	Circulatory nurse	:	Has antibiotic prophylaxis been given within 60 minutes?
	Anaesthetist	:	Yes, we gave it 10 minutes ago.
14.	Circulatory nurse	:	Dr. Angita, can you tell me if there are any critical or non-routine steps?
	Surgeon	:	There is no critical issue.
15.	Circulatory nurse	:	How long will the case take?
	Surgeon	:	This is a routine surgery. It will take under an hour.
16.	Circulatory nurse	:	What is the anticipated blood loss?
	Surgeon	:	Minimal blood is anticipated.
17.	Circulatory nurse	:	Are there any patient specific concerns?
	Anaesthetist	:	I have no special concerns regarding this case.
18.	Circulatory nurse	:	Nurse Dharamdas, has sterility been confirmed?

	Scrub nurse	:	Sterility was verified.
19.	Circulatory nurse	:	Are there equipment issues or any concerns?
	Scrub nurse	:	No, all instruments are ready and equipment are available.
20.	Circulatory nurse	:	Dr. Angita, is imaging needed for this case and is it displayed?
	Surgeon	:	Yes, it has been displayed.
	Circulatory nurse	:	Thank you
	Surgeon	:	Thank you. Can we start, Knife please.

SIGN OUT

21.	Circulatory nurse	:	The procedure performed was Laparoscopic Appendectomy, Is that right?
	Scrub nurse	:	That's correct
22.	Circulatory nurse	:	All the instrument, sponge and needle counts are correct?
	Scrub nurse	:	Yes, it is correct
23.	Circulatory nurse	:	I have a specimen labelled as appendix named Ms. Sonika. Is that right?
	Scrub nurse	:	That's right
24.	Circulatory nurse	:	Is there any equipment problem that needs to be addressed?
	Scrub nurse	:	No problem

25.	Circulatory nurse	:	What are the key concerns for recovery and management of this patient?
	Surgeon	:	Everything has been routine, patient is breathing by himself, his analgesia is being prescribed and he can go off to recovery.
	Circulatory nurse	:	Ok. We are done. Thank you very much everybody.

Annexure No: 5

PARTICIPANT INFORMATION SHEET

Participant Information Sheet

STUDY TITLE: A study to assess the effectiveness of demonstration on the knowledge and skill regarding surgical safety among operating room nurses working at AIIMS, Bhopal.

STUDY INVESTIGATORS:

- **Student**- Sandhya Kumari Sinha, M.Sc. Nursing (2022-24 Batch), Nursing College, AIIMS Bhopal
- **Guide:** Mr. R. Velmurugan, Assistant Professor, Department of Medical Surgical Nursing, Nursing College, AIIMS Bhopal
- **Co- Guide:** Mr. Kumarasamy AP, Assistant Professor, Department of Medical Surgical Nursing, Nursing College, AIIMS Bhopal

1. **Introduction**: We are conducting a research study to assess the effectiveness of demonstration on the knowledge and skill regarding surgical safety among operating room nurses working at AIIMS, Bhopal. If you agree to take part voluntarily, we will ask you to sign a consent form.
2. **Purpose of the study:** The aim of our study is to assess the effectiveness of my intervention on the knowledge and skill.
3. **Taking part – what it involves:**

a. Do I have to take part?

Participation in this research is entirely voluntary. A decision to not take part, or to withdraw at any time, will not affect your rights in any way.

b. What is expected of me if I take part?

If you participate, we will provide you demonstration and a lecture discussion on surgical safety along.

c. How long will my part in the study last?

Your participation in the study would last for one week, in which you will be given demonstration and after one week you will be asked to come for assessment of knowledge and skill.

d. Do I have to come for extra visits or undergo extra investigations for the study?

Yes, you will be asked to come after one week of the demonstration for assessment.

e. What are the possible benefits in taking part?

Taking part will help gain knowledge and skill regarding surgical safety checklist given by WHO which may result in improvement in patient safety.

f. What are the possible disadvantages and risks of taking part:

There are no major foreseeable disadvantages or risks because of the study. There may be risk of loss of privacy and confidentiality of information collected even though all possible measures will be taken to ensure safe data storage and access.

g. What happens to the information collected from me?

All information collected will be kept strictly confidential and not shared with anyone. Results from the study will be reported as group data and will not identify you in any way.

h. What if I change my mind regarding participation in the study?

You are entitled to change your mind and withdraw at any time during the study without any disadvantage or penalty.

i. Whom do I contact for more information or if I have further questions or concerns?

If you want any information or have questions or concerns, you can contact:

Ms. Sandhya Kumari Sinha

M.Sc. Nursing (2022-24) Batch
Medical Surgical Nursing,
Nursing College, AIIMS Bhopal
Email-
SANDHYAKUMARI.mscnursing22
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Dr. Shashank Purwar

Member Secretary,
Institute Ethics Committee – Student Research
(7773010099,
ihecpgr@aiimsbhopal.edu.in)

Annexure No: 6

PARTICIPANT CONSENT FORM

PARTICIPANT INFORMED CONSENT FORM (PICF)

Participant Identification Number for this Study: ……

Title of Project: A study to assess the effectiveness of demonstration on the knowledge and skill regarding surgical safety among operating room nurses working at AIIMS, Bhopal.

Name of Student Investigator: Ms. Sandhya Kumari Sinha

Tel No.(s): 8851698581

Name of Thesis Guide: Mr. R. Velmurugan

The contents of the information sheet dated……. that was provided have been read carefully by me / explained in detail to me, in a language that I comprehend, and I have fully understood the contents. I confirm that I have had the opportunity to ask questions.

The nature and purpose of the study and its potential risks/benefits and expected duration of the study, and other relevant details of the study have been explained to me in detail. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal right being affected.

I understand that the information collected about me from my participation in this research and sections of any of my medical notes may be looked at by responsible individuals from AIIMS. I give permission for this individual to have access to my records.

If participants is child, his/her verbal of written assent has been obtained.

I agree to take part in the above study.

_____

(Signature/Left Thumb Impression)

Date…… Place …….....

Name of the participant…….....

Son/Daughter/Spouse of…….

Complete Postal Address ……...

If illiterate.

The information sheet has been read and explained to the participant and given the opportunity to ask questions. I confirm that the individual has given consent freely.

_____

Signature of Legally acceptable representative or impartial witness.

Date:

Name of LAR or impartial witness:

Address:

This is to certify that the above consent has been obtained in my presence.

_____

Signature of the student Investigator Date …… Place……

Annexure No: 7

LIST OF EXPERTS IN CONTENT VALIDATION

S.No.	List of Expert
1	Dr. Anurag Bhai Patidar Associate Professor Nursing College AIIMS Bhopal
2	Dr. Jissa George Assistant Professor Nursing College AIIMS Bhopal
3	Ms. Smita Das Associate Professor College of Nursing AIIMS Delhi
4	Mr. Maneesh Sharma Assistant Professor College of Nursing AIIMS Rishikesh
5	Mr. Mahalingam Associate Professor College of Nursing AIIMS Bhubaneshwar

6	Dr. Zainab Ahmad Associate Professor Dept. of Anaesthesiology & Critical Care AIIMS Bhopal
7	Dr. Digpal Singh Assistant Nursing Superintendent Second floor modular OT AIIMS Bhopal
8	Mr. Midhun Kumar. M Assistant Nursing Superintendent MICU AIIMS Bhopal
9	Mr. Kanhaiyalal Rathore Assistant Nursing Superintendent MICU AIIMS Bhopal
10	Mr. Devesh Dheva Nursing Officer MICU AIIMS Bhopal

Annexure No: 8

CONTENT VALIDITY LETTER WITH CRITERIA

LETTER REQUESTING EXPERT'S OPINION AND SUGGESTIONS FOR THE CONTENT VALIDITY OF TOOLS

Date- 7/6/23

From,
Sandhya Kumari Sinha
M.Sc. Nursing First year student
Nursing college, AIIMS Bhopal.

To,
Dr. Anurag Bhai Patidar
Associate Professor
College of Nursing
AIIMS BHOPAL

Subject: Requesting the expert's opinion and suggestions for the content validity of research tools

Respected Sir/ Madam,

I, Sandhya Kumari Sinha, M. Sc. Nursing student in Medical Surgical Nursing (Critical Care Nursing) at nursing college of AIIMS Bhopal, have selected the topic mentioned below for my dissertation to be submitted as partial fulfillment of Masters in Nursing Degree programme, at the nursing college, AIIMS Bhopal.

Topic: "Effectiveness of demonstration on the knowledge and skill regarding surgical safety among operating room nurses working at AIIMS Bhopal."

In this regard I have prepared the following tools:

I) TOOL FOR DATA COLLECTION:
- **Section 1**- Socio-demographic data
- **Section 2**- Self-structured Knowledge questionnaire
- **Section 3**- Observation checklist

II) INTERVENTIONAL PROTOCOL
- **Section 4**- Lesson plan for surgical safety checklist
- **Section 5**- Role play script for surgical safety checklist

May I request you to kindly go through the content and give your valuable remarks and suggestions for any modification needed. I also plea you to accept the request and sign the enclosed certificate of validation.
I shall be grateful to you for your valuable remarks and suggestions.

Thanking you in anticipation.
Yours sincerely,
Sandhya Kumari Sinha
M.Sc. Nursing First year student

GUIDE
Mr. R. Velmurugan
Assistant Professor
Nursing College
AIIMS Bhopal

आर. वेलमुरुगन/R. Velmurugan
सहायक प्राध्यापक/Assistant Professor
नर्सिंग महाविद्यालय/Nursing College
एम्स, भोपाल, मध्य प्रदेश-462020
AIIMS Bhopal, (M.P.)-462020

CO-GUIDE
Mr. Kumarasamy AP
Assistant Professor
Nursing College
AIIMS Bhopal

कुमारासामी अ.पो./Kumarasamy AP
सहायक प्राध्यापक/Assistant Professor
नर्सिंग महाविद्यालय/Nursing College
एम्स, भोपाल, मध्य प्रदेश-462020
AIIMS Bhopal, (M.P.)-462020

Mrs. Mamta Verma
I/C PRINCIPAL
Nursing College
AIIMS Bhopal

Enclosed with: Brief synopsis, Letter of permission, Research tool, Criteria checklist for content validity of the tool, Certificate of validation.

CRITERIA FOR VALIDATION – TOOL OF THE STUDY

Dear Expert,

The scale contains 8 items regarding sociodemographic data. We need your expert judgement on degree of relevancy of each item to the measured domains. If there are any suggestions, please mention in the remark column.

1) Socio-demographic data

Item no.	Highly relevant 4	Quite relevant 3	Somewhat relevant 2	Not relevant 1	Remark
1.					
2.					
3.					
4.					
5.					
6.					

Dear Expert,

The scale contains 20 items regarding Self-structured Knowledge questionnaire. We need your expert judgement on degree of relevancy of each item to the measured domains. If there are any suggestions, please mention in the remark column.

2) Self-structured Knowledge questionnaire

Item no.	Highly relevant 4	Quite relevant 3	Somewhat relevant 2	Not relevant 1	Remark
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					

Dear Expert,

The scale contains 25 Simulation Observation checklist items regarding sociodemographic data. We need your expert judgement on degree of relevancy of each item to the measured domains. If there are any suggestions, please mention in the remark column.

3) Simulation Observation checklist

Item no.	Highly relevant 4	Quite relevant 3	Somewhat relevant 2	Not relevant 1	Remark
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					

Dear Expert,

The lesson plan for surgical safety checklist contains 8 objectives. We need your expert judgement on degree of relevancy of each item. If there are any suggestions, please mention in the remark column.

4) Lesson plan for surgical safety checklist

Objective No.	Highly relevant 4	Quite relevant 3	Somewhat relevant 2	Not relevant 1	Remark
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					

Dear Expert,

The simulation script for surgical safety checklist contains 5 items. We need your expert judgement on degree of relevancy of each item. If there are any suggestions, please mention in the remark column

5) Simulation script for surgical safety checklist

Item No.	Content	Highly relevant 4	Quite relevant 3	Somewhat relevant 2	Not relevant 1	Remark
1.	**Preparation of role play**					
2.	**Introduction**					
3.	**Section: Sign In**					
4.	**Section: Time Out**					
5.	**Section: Sign Out**					

Annexure No: 9

CERTIFICATE OF VALIDATION

Certificate of validation

This is to certify that the tool prepared by Sandhya Kumari Sinha, M.Sc. Nursing 2022 batch student, Nursing college, AIIMS Bhopal, to be used in her study titled "**A study to assess the effectiveness of demonstration on the knowledge and skill regarding surgical safety among operating room nurses working at AIIMS Bhopal"** has been validated by me and is found to be **valid/ not valid.**

Overall Remark-

Signature:

Name of the expert:

Designation:

Name of the Institution:

Official seal:

Date:

Place:

Annexure No: 10

MASTER DATA SHEET WITH KEY

Subject	AGE (yrs)	AGE coding	GENDER	EDUCATIONAL QUALIFICATION	EXPERIENCE IN OR	ATTENDED EDUCATION	FOLLOW CHECKILST	Knowledge Total	Knowledge code	Skill Total	Skill Code
C1	26	2	2	2	2	1	1	18	1	21	1
C2	28	2	2	2	1	2	1	18	1	20	2
C3	29	2	2	2	1	2	1	18	1	22	1
C4	25	1	2	2	1	1	1	18	1	23	1
C5	32	3	1	2	1	2	1	15	2	17	2
C6	25	1	2	2	2	1	1	18	1	21	1
C7	28	2	2	2	2	1	1	19	1	24	1
C8	32	3	1	1	2	2	1	18	1	21	1
C9	27	2	1	2	2	2	1	19	1	23	1
C10	29	2	2	3	2	1	1	17	1	17	2
C11	28	2	1	2	2	2	1	14	2	16	2
C12	33	3	2	2	2	1	1	18	1	21	1
C13	26	2	1	2	1	1	1	20	1	23	1
C14	26	2	1	1	1	1	1	16	1	17	2
C15	28	2	2	2	2	2	1	15	2	16	2
C16	30	2	2	2	2	1	1	17	1	19	2
C17	32	3	1	3	1	1	1	18	1	20	2
C18	32	3	1	2	2	2	1	13	2	19	2
C19	29	2	2	1	2	1	1	17	1	19	2
C20	34	3	1	2	2	1	1	19	1	22	1
C21	28	2	2	2	1	1	1	15	2	16	2
C22	30	2	1	2	2	2	1	16	1	18	2
C23	31	3	1	1	2	1	1	14	2	17	2
C24	27	2	1	2	2	2	1	17	1	16	2
C25	25	1	2	2	1	1	1	16	1	23	1
C26	29	2	2	3	1	1	1	19	1	23	1
C27	26	2	1	2	2	2	1	17	1	20	2
C28	31	3	2	2	2	1	1	20	1	25	1
C29	29	2	2	1	2	1	1	18	1	20	2

C30	32	3	1	2	2	1	1	17	1	23	1
E1	25	1	2	2	2	1	1	20	1	25	1
E2	28	2	1	1	1	1	1	19	1	23	1
E3	24	1	2	2	1	1	1	19	1	24	1
E4	27	2	2	2	1	1	1	18	1	22	1
E5	26	2	2	2	2	1	1	17	1	20	2
E6	31	3	1	2	2	1	1	19	1	25	1
E7	31	3	1	1	1	2	1	15	2	22	1
E8	34	3	1	2	2	1	1	19	1	24	1
E9	31	3	1	1	2	1	1	18	1	24	1
E10	30	2	1	2	1	2	1	18	1	20	2
E11	30	2	1	2	2	2	1	19	1	23	1
E12	32	3	1	2	2	1	1	20	1	25	1
E13	35	3	1	2	2	1	1	19	1	24	1
E14	29	2	2	2	2	1	1	19	1	23	1
E15	29	2	2	2	1	2	1	18	1	22	1
E16	31	3	1	1	2	1	1	19	1	23	1
E17	32	3	1	2	2	1	1	18	1	22	1
E18	24	1	1	2	1	1	1	18	1	23	1
E19	25	1	1	2	1	1	1	19	1	24	1
E20	28	2	2	1	2	1	1	19	1	25	1
E21	27	2	2	1	1	2	1	19	1	24	1
E22	31	3	2	2	2	1	1	20	1	24	1
E23	29	2	1	2	2	2	1	20	1	25	1
E24	32	3	2	3	2	2	1	19	1	20	2
E25	26	2	2	2	1	1	1	17	1	22	1
E26	25	1	1	2	1	1	1	19	1	24	1
E27	26	2	1	2	1	1	1	15	2	23	1
E28	34	3	1	1	1	1	1	20	1	25	1
E29	27	2	2	2	2	2	1	18	1	24	1
E30	30	2	2	3	2	1	1	19	1	25	1

MASTER DATA SHEET KEY

Demograbhic Variables	Category	Coding
AGE	21-25yrs	1
	26-30yrs	2
	31-35yrs	3
	>35yrs	4
GENDER	M	1
	F	2
EDUCATIONAL QUALIFICATION	GNM	1
	BSc Nursing	2
	MSc Nursing	3
	others	4
EXPERIENCE IN OR	<1yr	1
	1-5yrs	2
	>5yrs	3
ATTENDED EDUCATION	YES	1
	NO	2
FOLLOW CHECKLIST	YES	1
	NO	2